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# LEGAL MEDICINE AND TOXICOLOGY

*BY MANY SPECIALISTS*

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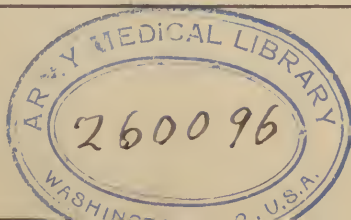
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We take pleasure in announcing that in the preparation of this edition of "A Text-book of Legal Medicine and Toxicology" we have secured the co-operation of Dr. Ralph W. Webster, who becomes a co-editor in the work.

In order more correctly to indicate the character of the work the title has been changed to "Legal Medicine and Toxicology."

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## PREFACE TO THE SECOND EDITION

THE present edition of this work follows closely the outlines of the first edition, both in arrangement of subject matter and in selection of topics treated. The articles are arranged, for convenience of reference, into two sections, Part I and Part II, the latter being devoted to Toxicology and all other portions of Legal Medicine in which laboratory investigation is generally an essential feature. In order that responsibility for statements of facts and opinions may be authoritatively placed upon the individual contributors, the articles composing the two volumes have been inserted, as in the first edition, with but few editorial changes, and those of an unimportant nature. Where direct statements are made by the editors with reference to any point in the text, the matter is inserted in the form of an "Editorial Note" for which the editors assume the responsibility.

Practically every article of the former edition has been thoroughly revised or entirely rewritten and brought up to the present-day knowledge of the subject treated. Many of our former colleagues, we are happy to state, have undertaken the revision of their articles. For such personal rewriting of articles appearing in the first edition we are indebted to Dr. Samuel T. Armstrong; Dr. William T. Belfield; Dr. Charles G. Chaddock; Dr. J. Chalmers DaCosta; Dr. Edward P. Davis; Dr. W. A. Newman Dorland; Dr. James Ewing; Dr. A. L. Goldwater; Dr. Walter S. Haines; Dr. Graeme M. Hammond; the late Dr. James W. Holland; Dr. Reid Hunt; Dr. Smith Ely Jelliffe; Dr. Frank Warren Langdon; Dr. Harold N. Moyer; Dr. Frederick Peterson; Dr. Allen J. Smith, and Dr. Victor C. Vaughan.

Owing to the death of some authors and inability of others to revise or rewrite their sections, it has been necessary, in arranging for this second edition, to call upon many new collaborators. For partial or complete revisions of former articles or for entirely new articles on certain of the subjects we are under obligations to the following authorities: Dr. Albert M. Barrett; Dr. E. V. L. Brown; Dr. Alexander O. Gettler; Dr. A. L. Goldwater; Dr. Ludvig Hektoen; Dr. John F. X. Jones; Dr. Edwin O. Jordan; Dr. Foster Kennedy; Dr. Herman L. Kretschmer; Dr. Edwin R. Le Count; Dr. Dean Lewis; Dr. Baldwin H. Lucke; Dr. William D. McNally; Dr. Harold N. Moyer; Dr. John Jenks Thomas, and Dr. Ralph W. Webster. For the section on "Summaries of State Laws Relating to the Insane" we are indebted to the executive officers of the National Committee for Mental Hygiene for permission to use its monograph on this subject.

In these revisions several new topics have been introduced, such as legal procedure in medicolegal cases, the forensic relations of cremation, and the possible legal complications following the application of radium and the ultra-violet rays; while in the sections dealing with toxicology a considerable number of additional poisons have been treated of. Thus, in the article on "Inorganic Poisons" there are discussed for the first time sodium silicate, potassium permanganate, lithium salts, magnesium sulphate, thorium salts, tellurium salts, manganese salts, vanadium salts, cadmium salts, and fluorin and its salts; while a very extensive consideration is accorded the organic arsenicals, which are assuming such importance at the present time. In the section on "Alkaloidal Poisons," the cocain substitutes, emetin and diacetylmorphin, are added to the former poisons discussed, while the subject matter relating to most of the other alkaloids has been greatly enlarged. In the discussion of "Non-alkaloidal Organic Poisons" the new subjects treated embrace carbon tetrachlorid, tetrachlorethane, veronal, thymol, trinitrotoluene, and oil of chenopodium, and the portion dealing with methyl alcohol has been much elaborated, as have also many other sections of the article. The toxicology of the various war gases is given full treatment both in the section on "Gaseous Poisons" and in the article on "Asphyxia."

There have also been introduced into this edition several entirely new articles not appearing in the first edition. These additional sections include "Common Law and Statutory Obligations of Pharmacists," by Dr. James H. Beal; "Identification of the Living," by the late Alphonse Bertillon; "Poisonous Mushrooms," by Dr. William W. Ford; "Forensic Questions Relating to Poisoning," by Dr. Walter S. Haines and Dr. Ralph W. Webster; "Industrial Poisoning," by Dr. Alice Hamilton; "Legal Rights and Obligations of Physicians," by Dr. Harold N. Moyer; and "Protein Poisoning," by Dr. Victor C. Vaughan.

In statements as to weights and measures both the English and metric systems are usually given and temperatures are stated in both the Fahrenheit and Centigrade scales, in order that the subject matter may be clearly intelligible to courts and juries as well as to those who are especially interested in the scientific aspects of the subjects discussed.

In giving the names of drugs and chemicals we have followed the nomenclature and, with slight modifications, the spelling of the United States Pharmacopœia (ninth revision, 1916), believing that adherence to this accepted authority will avoid confusion and perplexities to both lawyer and physician; at the special request of the publishers we have omitted the final "e" in the spelling of such words as chlorine, bromine, etc., and their salts; oxides, sulphides, etc.; and of the names of all the alkaloids.

We take great pleasure in expressing our deep gratification at the cordial reception accorded the first edition of this work by the medical and legal professions, and we desire to return our sincere thanks and to express our deep obligation to the many distinguished colleagues who

have aided us in the production of the work by their valuable contributions; and we wish to convey to the publishers, W. B. Saunders Company, our appreciation of the great interest which they have taken in the work and of the courtesies which they have extended to us during its preparation.

FREDERICK PETERSON,  
WALTER S. HAINES,  
RALPH W. WEBSTER.

*February, 1923.*





## PREFACE TO THE FIRST EDITION

THE object of the present work is to give to the medical and legal professions a fairly comprehensive survey of forensic medicine and toxicology in moderate compass. We believe this has not been done in any very recent work in English. A number of manuals of limited size and scope have been presented on the one hand, and on the other certain systems of legal medicine of almost encyclopedic dimensions. Both find fields of great usefulness; but there is still left a broad ground intermediate between the two which we trust the present work will fill, and it was in this hope that the book has been planned and executed.

With few and wholly unimportant exceptions the articles composing the two volumes have been inserted without change by the editors. This has been done in order that the responsibility for statements of facts and opinions may be authoritatively placed upon the individual contributors—a matter of much moment in legal proceedings. In doing this we are aware that we have occasionally sacrificed unity of plan and harmony of views, but the advantages, especially to the legal profession, of individual responsibility we believe much more than compensate for these defects.

As the ordinary English weights and measures and the Fahrenheit thermometer scale are still the only ones easily understood by the majority of courts and juries, we have generally used these measures wholly or in conjunction with their equivalents in metric weights and measures and the Centigrade scale. This rule, however, has not been followed in the description of purely chemical tests and processes, as the metric system is practically universally employed in connection with them.

In the names of drugs and chemicals we have followed the nomenclature and, with slight modifications, the spelling of the United States Pharmacopœia, believing that by adhering to so authoritative and well known a standard as this much confusion will be avoided and a not infrequent source of perplexity to lawyers and physicians eliminated.

The work is divided, for convenience of reference, into two sections, Part I and Part II, the latter being devoted to Toxicology, and all other portions of Legal Medicine in which laboratory investigation is an essential feature.

Our thanks are due to the many distinguished men who have aided us in the production of the work by their valuable contributions; and we are greatly indebted to the publishers, Messrs. W. B. Saunders & Co., for the unfailing interest they have shown in the book, and for the numerous courtesies they have extended to us in its preparation.

FREDERICK PETERSON  
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# INTRODUCTION

BY FREDERICK PETERSON, M. D.,

NEW YORK CITY

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CHICAGO, ILL.

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## GENERAL CONSIDERATIONS

LEGAL medicine, medical jurisprudence, or forensic medicine may be defined as that branch of jurisprudence which pertains to the elucidation and determination of questions in law requiring technical knowledge of the medical sciences. The subject is one which calls for information and investigation along widely divergent lines, in following which members of the legal and medical professions may seek the advice and counsel of one another, in which case each acts in his specific professional capacity. Among the questions arising at times in legal procedures are such as concern the causes of death, the identity of the living and the dead, the results of wounds and injuries of all kinds, life and accident insurance, mental incompetence from various causes, malingering, legitimacy, abortion and infanticide, impotence, sterility and unnatural offenses, marriage and divorce, malpractice, and the many points involved in relation to the science of toxicology.

Medicolegal science is a very old one, coming down to us from great antiquity. While the modern literature of this subject is largely written from the medical point of view, yet its earlier history is found in historic writings, early criminal codes, and records of court proceedings, as well as in medical writings. Although the early Egyptian and Hindoo literature would indicate that many medical questions of fact were considered in legal proceedings, yet, strangely enough, little use of medical knowledge seems to have been made in the legal procedure of the advanced Greek and Roman civilizations. It was especially in France, Germany, and Italy that frequent medical aid was rendered in judicial proceedings throughout the middle ages, recognition of the relationship between the two professional branches becoming so marked in the 16th and 17th centuries that this science showed signs of being established on a firm foundation. In the 18th century we note the presence in various continental universities of professorships of legal medicine and a marked growth of the scientific literature of the subject. Gradual development has been observed in the different phases of the science until, today, we have medical



jurisprudence recognized as an important part of the instruction in both the medical and law schools throughout the world.

## EXPERT EVIDENCE

To aid in the elucidation of these problems before the court, medical men, who are especially skilled in some one branch or other of the medical sciences, are called upon to testify as to their opinions or as to the facts and the deductions to be made from the facts set before the judicial body. These witnesses, known as experts, are general practitioners, specialists in some one or more branches of medicine, surgeons, and chemists. Sometimes the questions involved are such that any general practitioner of skill and experience is qualified to determine them. Sometimes only a skilled pathologist, neurologist, alienist, obstetrician, surgeon, or chemist is able to unravel the intricate problem. The domain of scientific medicine has expanded so widely of late years that no single mind can now compass the details of all branches of medical science. The omniscient mind of the expert of other days is now impossible. The literatures of neurology and toxicology as related to law have in themselves become voluminous beyond the grasp of the general practitioner of medicine or of any single medico-legal expert. It is well to point out, in passing, that the medical expert must be, from the very nature of his relationship to the procedure, really a judicial advisor as to the medical points involved in the case and, as such, must be allowed to make whatever deductions seem to him warranted by the facts as introduced either by himself or by others.

**Ordinary and Expert Witnesses.**—For the purpose of definition it would seem wise to outline the distinction between the “ordinary” and the “expert” witness. An ordinary witness is one who testifies as to matters of fact as he himself has learned them through his own special senses. He may state only what he knows of his own knowledge, making no use whatever of matters of hearsay evidence beyond such statements as he may have heard made by others in the presence of the defendant in the case. Further, he may draw no conclusions from such facts as he may introduce into evidence beyond such deductions as are matters of common experience or are, as stated by Wharton, the results of a process of reasoning familiar to every-day life and may be verified by the adjudicating tribunal.

An expert witness is one who testifies as to the facts gained by himself through his investigations of the case and as to the deductions which he draws from these facts or from the facts introduced into evidence by others. His functions are essentially judicial, his conclusions being the results of a process of reasoning which can be determined only by special scientists through their experience and training in the field involved in the inquiry. As Wharton<sup>1</sup> states in his “Evidence,” “Where conclusions depend upon facts whose evidential weight can only be determined by those familiar with a particular specialty,

<sup>1</sup> Section 437.

these conclusions must be given by experts in such specialty." When called upon to state mere facts which he has observed, the witness is an ordinary one, however skilled he may be in his specialty. However, should he be called upon, while upon the witness stand, to interpret his facts from his knowledge and experience of the subjects involved in the case, or should he be asked to draw conclusions from facts introduced by others, he then becomes an expert witness and is entitled to all the considerations shown to such witnesses.

**Difficulties in Interpretation of Evidence.**—The difficulties that enter into the interpretation of all sorts of matters pertaining to the art and science of medicine are especially noteworthy in many departments of medical jurisprudence. There are numerous questions which must be decided from the standpoint of the value of human evidence, and there are several conditions which modify the value of human evidence and vitiate our inferences and judgments. There is no difficulty with facts which are known and accepted by all mankind. The accumulated experience of ages has thoroughly sifted the evidence as to matters of common knowledge, such as the roundness of the earth, the certainty of death, and the accuracy of figures. But there are several sources of error in the critical balancing of testimony in relation to doubtful things, theories, hypotheses, and a host of matters pertaining to "the million acres of our ignorance." In an inquiry of this nature there are obviously two important factors: first, the quality of the phenomenon observed; second, the character and quality of the observer. The phenomena we are called upon to consider in forensic medicine are often indefinite, shadowy, and illusory. The observer himself is hampered by the uncertain evidence of his more or less imperfect senses, sometimes by his undisciplined intellect, by the perversions of hazy memory, by the limitations of his general knowledge and experience, perhaps by the modifying influence of emotions, and, very rarely, it is true, by a tendency to deliberate deception and misrepresentation of the matters under consideration. We are constantly confronted, in our study and practice of medicine, with the mass of our ignorance of the things yet to be known, and with the defects and limitations of the students of these things. Despite this, however, we are constantly wresting from nature her marvelous secrets, and surprising and uplifting the world with our discoveries. It is interesting to examine the practical psychology involved in the elucidation and acceptance of any new fact or problem. Compare the knowledge of cerebral localization at the time of Hippocrates and at the present day, and contemplate the shifting mass of ignorance concerning this subject during those twenty-three centuries. Think of the thousand preposterous assertions concerning the brain, the thousand absurdities current, the thousand errors promulgated, the work of the multitude of quacks, philosophers, psychologists, physicians, anatomists, physiologists, and pathologists during all those centuries before what seem to us now such simple truths won the acceptance of the modern world. And with regard to the things yet to be discovered in this great unseen



and unknown universe about us the same process of sifting the good from the bad evidence goes ever on in the selfsame way.

Quacks and empirics are with us still, making all sorts of fraudulent claims and ridiculous assertions. We have them in the medical profession—adventurers, seekers after notoriety and fortune, exploiting some panacea or other. On a plane but little higher than this we have a class of pseudoscientists, men who occupy a quasireputable position in the profession, and seek by every means to enhance their reputations, even by deliberate falsification of their observations, proclaiming new discoveries in pathology and therapeutics which they know to be untrue, but which they feel may pass scrutiny for a long time because of the obscurity of our scientific data and the intricacies of the problem they pretend to solve. Then we come to the body of real workers in every field of medical science, men filled with that eager enthusiasm and burning love of truth which lead them to immolate themselves upon the best of sacrificial altars, that of human progress. It is chiefly upon the errors of these that we wish to dwell, to point out the conditions which often vitiate their evidence.

**Errors in Interpretation of Evidence.**—In the first place, there are our imperfect senses—those narrow and dim avenues through which we gain all our knowledge of the outer world. They are more or less imperfect in all of us; the absolutely unerring eye and the invariably unailing ear have only a theoretic existence; they are not found in real life. And what is true of seeing and hearing, may be repeated of the other senses, and possibly with even more emphasis. It is not, then, to be wondered at that the same occurrence often produces quite dissimilar impressions on different witnesses, and that sometimes no two persons will agree in every detail as to what has occurred. A certain degree of color-blindness, astigmatism, deafness, or other imperfection—often unknown and frequently only temporary—makes some people at times the victims of their unreliable senses and renders them more or less untrustworthy observers. But the senses may be cultivated like the muscles, and even to a greater degree, and the real expert, therefore, is far less liable to errors of observation than the untrained, and it is this fact, largely, that gives to true expert evidence its great value.

It is not alone the illusions to which our defective senses are so subject that lead to mistakes and misinterpretations, but there are even greater sources of error in the psychic processes connected with these faulty senses. There are few observers who possess that disciplined intellect, that even temperament, that calm judgment, so necessary to the critical and unprejudiced examination of phenomena. Many medical men have limited horizons, owing to a lack of thorough training and to a want of familiarity with the ascertained data of the many cognate sciences with which their own lines of research are more or less correlated. They are, in other words, deficient in their store of experiences. Another defect lies in want of the imaginative faculty. In studying the unknown we may be handicapped by an inability to

conceive of the qualities and character of the phenomena that are hidden, by an unconsciousness of the very existence of such phenomena.

Still another fallacy in our interpretation of phenomena is due to the vitiating influence of the emotions upon the judgment. A man's character has been said to be the sum of his ethical emotions, and his judgment of natural phenomena, especially of what we may term preternatural phenomena, is almost sure to be biased in some degree by the feelings of fear, pleasure, reverence, awe, sympathy, or antipathy which they inspire. These feelings of his are a reflex of the sum of his emotional sensations, experienced throughout his whole life in relation to events, customs, religious views, and all sorts of convictions and beliefs. Another and very intangible source of error in evidence, particularly in regard to occult phenomena, has been described as "the instinctive tendency of the imagination to dramatic unity and completeness." A pathologist, for instance, begins a difficult piece of work, and in his eagerness and impatience to bring it to a successful issue he may unconsciously pervert the evidence presented to fit some pre-conceived theory or idea, shaping it into a harmonious unity.

So to sum up, the chief sources of error in evidence as to even tangible and palpable phenomena and facts, such as those of physiology, diagnosis, pathology, therapeutics, forensic medicine, statistics, and the like, are very great and far-reaching. They consist of:

1. Deliberate fraud, as in all species of quackery.
2. Wilful perversion of facts by pseudoscientists.
3. Objective errors through limitation and defect of the senses.
4. Limited horizon through defective experience and education.
5. Insufficiency of the imaginative faculty.
6. Vitiation of evidence under influence of the emotions.
7. The innate tendency of the mind to completeness, to dramatic unity in unraveling a mystery.

**Status of Expert Witnesses.**—The great progress of the last fifty years in scientific medicine has been manifested also in an elevation of the principles of forensic medicine. Many questions, upon which formerly there would have been a difference of opinion between doctors, have now become established facts. We have a better knowledge and a better class of experts to aid in the cause of justice. But even so, there is much improvement to be desired, and expert testimony has still a reputation for uncertainty and difference which better methods in the selection of the expert witnesses and better methods of presentation of their really valuable testimony before the tribunal will finally overcome. Among the evils of the present system is that in some departments of legal medicine physicians, who are really not experts in the true sense of the word, can still qualify as such. A professorship of therapeutics and of insanity in an unimportant medical school, the honorary position of consulting physician to an asylum, or the position of a coroner's physician, does not necessarily qualify a physician as an expert alienist or pathologist, and yet the court generally recognizes such nominal insignia of office as evidence of fitness to testify, though the

professor of therapeutics may have no practical knowledge of insanity, though the physician may never have visited the asylum to which he has been made consultant by courtesy, and though the coroner's assistant may have been created by purely political influence, with no regard to his attainments as a pathologist. An evil of this kind has perhaps no remedy save in the elevation of the ideals and standards of the whole body of medical practitioners. Its correction can be made by physicians alone or in co-operation with members of the legal profession, who can, in their choice of experts, select only such as are known to be of high reputation for honor and integrity. In some countries, as in Germany and France, there is a list of officially appointed experts in various branches of medical science from which the court may choose at its pleasure, but in this country no such list of specialists exists, and, indeed, there would be great difficulty in the selection and appointment of a body of experts, since there would be no means to determine the choice without political or social influence. It is possible that a committee of unbiased physicians appointed from a reputable medical society could establish a list of specialists qualified for court duties, but there are many medical societies in the regular profession, and there are several schools of medicine outside of the regular school which are legally recognized, so that a harmonious choice in the interests of righteousness and justice would be at present quite unattainable.

Another evil consists in the employment of experts by each party to the legal controversy, so that the experts are in a manner opposed to each other, and however unprejudiced may be his intention, there must be often an unconscious tendency on the part of the witness to be biased toward the side that has secured and pays for his services, a certain infirmity innate in human mind and character. This evil is overcome in French law by the court ordering an investigation by experts, either selected conjointly by the contending parties or appointed by the court itself. The method in Germany is similar. In either country the court may be guided by the expert opinion signed and submitted to it, or may order a new investigation, or, finally, may not feel constrained to be bound by such opinion if opposed to the judge's own convictions. The reason that our system has not long ago been altered to meet the needs of justice lies in the chief characteristic of the American method of criminal trial—viz., that the accused shall be allowed to produce any proper legal or medicolegal evidence in his own favor and shall have the opportunity of cross-examining any witness who may introduce evidence; that the judge alone is judge of the law, and that the jury alone is arbiter of the facts.<sup>1</sup> In England the court procedure in the matter of experts is quite identical with that of the United States. It has been suggested—and the system is in actual use in some parts of England—that the reproach which at present attaches to expert testimony might be remedied by the medical witnesses themselves, in refusing to testify until after conference with

<sup>1</sup> In Illinois, Indiana, Maryland, and a few other states the jury is the judge of both the law and the facts in criminal cases.



experts of the other side. In time these defects of our system must be obviated, for as matters now are many judges express themselves as unimpressed by experts, juries may discredit them, the experts themselves chafe under the stigma attached to their testimony, and justice all too frequently miscarries.

**Advice to Those Called as Expert Witnesses.**—The medical man who is summoned as a witness in a trial should be guided by a few simple rules of conduct, which may be briefly summarized as follows:

1. In all cases in which your opinion is asked, it is well to arrange with your client for a proper fee for an investigation of the case and for your opinion on the facts he may set before you, with the express understanding that you are not to undertake to be a witness should you not be wholly satisfied as to the merits of the case. While the expert may or may not be summoned to appear in court by the ordinary procedure of subpoena, if such a process is served upon him he must obey it just as any other witness. The attempt may be made by this subpoena to get him into court for the purpose of obtaining his expert opinion without the payment of the compensation to which he is entitled as an expert. It is to be remembered that his knowledge and skill is his own property and that he cannot be deprived of it without just compensation. Under such conditions his course should be to state to the court that he has not been paid or promised any other compensation for his testimony than that of an ordinary witness and that he declines to give an expert opinion in the case without just compensation. In most states his contention is upheld, although in some states he may be forced to answer the questions calling for his expert opinion. It is the general rule, however, that the expert is entitled to compensation for his opinion beyond that of the ordinary witness. If, however, the attending physician be called as a witness of fact and his expert opinion be asked regarding the case, the conditions are somewhat different, inasmuch as his opinion, under the circumstances, is a part of his relationship of physician to patient. Here he can be made to give opinions without any assurance of other than the ordinary per diem witness fees.

2. Before going on the witness-stand make yourself thoroughly familiar with all the facts upon which you are to testify.

3. After acquainting yourself with all the facts bearing upon the case and carefully considering the opinions you would deduce from them, it is well to refresh your memory by reference to the views held by standard writers in relation to the subject in hand.

4. Have a conference, if possible, with the experts of the other side for the purpose of interchanging views.

5. Refuse to give evidence as an expert if you have the least doubt as to the correctness of your opinion founded upon the facts adduced.

6. On the witness-stand let your bearing be dignified and grave; remember that the conviction or acquittal of a human being may hang upon your testimony, and avoid, therefore, any flippancy of manner.

7. In testifying use plain and simple language, avoiding technical

medical and scientific terms wherever possible. Common Anglo-Saxon terminology appeals best to the average jurymen.

8. Having all your facts and opinions systematically arranged beforehand in your mind, be explicit and definite as to these, and especially as to dates, distances, sizes, weights, and all other measurements.

9. Remember that your answers to questions are taken down, recorded, and often printed, and that the evidence you give this day may be reinvestigated at a subsequent trial, and your opinion in this case brought before you in some other issue, so that you should clearly understand each question put to you, and answer it deliberately, carefully, and coherently.

10. Answer directly and simply the question which is asked, volunteering nothing beyond what is required to place the facts or opinion requested clearly before the court. You will sometimes be asked in cross-examination to answer a question by "yes" or "no" only, and in case such monosyllabic replies are not misleading you should answer in this way; but if, as is often the case, they give only a part of the truth, it is your duty to explain this fact to the court and request the privilege of modifying the "yes" or "no" so that it may entirely represent your views.

11. It is sometimes difficult for a witness to avoid the unconscious bias which makes him involuntarily hesitate to answer directly a question when he sees it may do harm to the side that employs him; but you are there "to tell the truth, the whole truth, and nothing but the truth," whether it is good or bad for one party or the other, and your straight unbiased answer to every question of examiner and cross-examiner will do much to dignify your testimony and to impress the jury with the sincerity and value of your statements. Never answer in such a manner as to allow even a remote suspicion that you are a partisan. On the other hand, however, in your desire to be perfectly fair do not permit the cross-examiner to obtain from you statements which directly or indirectly may be distorted in their application and lead to unfair inferences.

12. The cross-examiner may attempt to irritate you by his manner or by the character of his questions. It is almost needless to say that when he does this, he considers it a part of his duty to his client. He will usually resort to any legitimate means to minimize the value of your testimony, and will sometimes use even questionable methods to accomplish this. Be careful, clear, honest, and take no offense. You will then deprive him of one of his weapons. He may intentionally or by mistake mislead you through misquotations or misrepresentations of an author or by the exhibition of diagrams. Verify the quotations and the diagrams before answering questions connected with them.

13. If asked a question, the answer to which you do not feel certain of, do not hesitate to say so. It is the wisest witness that knows when to say "I do not know."

14. You may be asked if the work of such and such a writer is an authority, and upon assenting to this, quotations may be cited in oppo-

sition to the facts you may have given. Remember that in science, facts themselves are the only authority and that a book simply represents an attempt to present these facts. Books are, therefore, not in themselves authorities. Being sure of your facts, do not allow your judgment to be shaken, however great the reputation of the writer, for even the authors of books are mistaken sometimes and may misstate the known facts. If you desire quotations from other writers to substantiate your statements, you can arrange with the lawyer engaging you to lay such relevant matter before the jury either through yourself or other expert witnesses.

15. The law permits you to refresh your memory as to facts, dates, dimensions, etc., by reference to your original notes, but you may not read your notes to the court.

16. It is well methodically to separate in your mind the facts which you have to present from the opinions you deduct from them or deduce from the evidence offered to you.

**Advice to Lawyers in Selecting Experts.**—The lawyer, from his education in legal matters and from his experience in court procedures, naturally is much better informed than the average physician in regard to the best course to pursue in preparing expert evidence and in presenting it to the court and jury. In spite of this, however, the attorney sometimes falls into bad methods and indulges in practices that are harmful to himself professionally and to his client practically, and we believe that not infrequently he is quite as open to criticism as is the medical witness. In the same manner, therefore, as we have given advice above to the physician when called to the witness-stand, we would present to the advocate the following suggestions for his guidance in dealing with expert medical testimony:

1. In selecting experts engage only those whose efficiency and honesty are absolutely above the slightest suspicion. The desire to win a legal victory for one's client should never tempt the attorney to depart from this rule. Not only is it the honest way, but in the end it is the best way. An ignorant or dishonest expert will almost invariably be exposed eventually and bring discomfiture to the cause for which he has testified. The disrepute into which expert testimony has fallen is due quite as much to the legal profession as to the medical, and were attorneys to refuse in all cases to engage any but perfectly competent and honorable experts, the opprobrium that has come upon it would soon be removed.

2. Before entering upon the trial of a case the attorney should have a complete consultation with his expert witness or with all of them, if more than one is engaged, and this should be done preferably when all are assembled. The attorney should know in advance exactly what facts, theories, deductions, and opinions the witnesses will testify to, and if more than one witness is engaged, an exchange of views between them will also serve to correct erroneous views which may by chance be held by some of the experts themselves. A failure thus to become completely familiar with the views of the expert witness has



in more than one case with which we are acquainted been the cause of a miscarriage of justice.

3. It is obviously beyond the power of any attorney, no matter how well informed, to make himself, unaided, entirely familiar with the subjects presenting themselves during the trial of any except the simplest medicolegal cases. It is advisable, therefore, that a thoroughly informed expert of quick intellect be engaged by the attorney to help him in the preparation of the case and to sit at his side during the trial to aid him in preparing questions, especially during the cross-examination. It is inadvisable, however, that such expert be afterward called to the witness-stand on account of the bad moral effect on the jury. Thoroughly honest and honorable though he may be, and perfectly legitimate as his association with the attorney has been, the impression is liable to be conveyed to the jury that he is a semi-advocate, and his testimony, however unprejudiced it may be in reality, is likely to be accepted with doubt, and may inferentially throw discredit upon the testimony of other witnesses. For the same reason it is better for the attorney to have no communication of any kind, in the presence of the jury, with those of his experts who testify in the case. All communication, however brief, should be carried on outside the court room.

4. In the cross-examination of an expert witness the cultivated and wise attorney will not resort to brow-beating or harsh or deceitful methods unless he is positively convinced of the dishonesty of the witness, when such tactics may sometimes be required. With an expert, however, of honesty and capability nothing is so likely to lead him into partisan ways and the making of emphatic statements as harsh or ungentlemanly treatment at the hands of his examiner. As a mere matter of policy, therefore, laying aside more ethical reasons, the attorney does well to avoid such methods.

## LEGAL PROCEDURE

There can be no conviction or punishment for a crime without a formal and sufficient accusation. In the absence thereof a court acquires no jurisdiction whatever, and if it assumes jurisdiction, a trial and conviction are a nullity. The accusation must charge an offense; it must charge the particular offense for which the accused is tried and convicted; and it must be made in the particular form and mode required by law. The constitution of the United States declares that "in all criminal prosecutions, the accused should enjoy the right to . . . be informed of the nature and cause of the accusation," and there are similar provisions in the state constitutions. There are also provisions in both the federal and state constitutions against depriving any person of life, liberty, or property without due process of law. Under these provisions the respective legislatures can neither dispense altogether with the necessity for a formal accusation nor, by prescribing a particular form or undertaking to do away with the necessity for particular allegations, render sufficient an accusation which fails to charge the



offense for which the accused is tried or fails to set it forth with such certainty as is reasonably necessary to inform him of the nature and cause of the accusation. In many jurisdictions the constitution also provides that offenses, or offenses of a particular grade or class, shall be prosecuted by a particular form of accusation, and in such cases a prosecution in any other mode, even with legislative sanction, is a nullity.<sup>1</sup>

The particular forms or modes of accusation now recognized are: (1) Coroner's inquest; (2) indictment or presentment by a grand jury; (3) information by the public prosecutor on behalf of the state; and (4) complaint or affidavit by a private individual.

1. **Coroner's Inquest.**—Under this heading reference is made to those cases in which there is reasonable cause to suspect that a person has died either a violent or unnatural death or has died a sudden death of which the cause is unknown. Many such cases arise especially in our large cities, so that it is necessary that some one be legally authorized to make inquiry into the cause of such deaths as well as into the nature and the circumstances surrounding it. In English-speaking communities this power is vested by law in the coroner, one of the most ancient offices in our common-law system. It is most certainly true that the investigations, at the hands of the coroner, afford no certainty of the detection of crime; that this system gives no protection to those wrongly charged with crime; and that, in some cases, it may screen a criminal by a verdict based upon an imperfect and not well considered inquiry of the coroner's jury, which is often made up of ignorant and unqualified jurors. Add to this the fact that no preliminary test of ability or capacity is required of a coroner beyond, oftentimes, his satisfying the requirements of a political machine. For the above reasons the office of coroner has been abolished in Massachusetts and in certain counties of New York and its abolition is under consideration in some other states.

In most states, where death has been due or is suspected to be due to violent or unnatural causes, or death is sudden from unknown causes, or there may be reason to suspect foul play, the case must be referred to the coroner for investigation. It is in this connection that the attending physician may be brought into the case. If he has reason to suspect that death is due to unnatural causes or if he is not absolutely certain as to the exact cause of the death of his patient, it becomes his duty to refuse to sign the death certificate, notifying the coroner of his suspicions concerning the case. Under these circumstances the coroner automatically assumes charge of the case and orders an investigation.

The power of the coroner is a judicial one, relating to inquiries into the cause of death by a jury of inquest over the body of a person who may have come to his death under such circumstances as are mentioned above. This investigation by the coroner is, as above stated, a judicial one, the coroner being required to act in person and not being permitted, except by express statute, to delegate his authority to a deputy.

<sup>1</sup> *Cyclopedia of Law and Procedure*, 1906, XXII, 171.

His authority to hold an inquest is not confined to the body of a person who may have died within his territorial jurisdiction, but extends to all bodies brought within his jurisdiction, no matter where the death has occurred. Having held an inquest over a body, he cannot conduct a second investigation unless the first inquiry has been quashed by a court of competent jurisdiction and a new investigation ordered. According to law he cannot hold an inquest except upon view of the body (*super visum corporis*), but he is not compelled to hold such inquest before burial of the body. If, later, he believes an inquest necessary, he may have the body disinterred and proceed with his inquest. In cities, where the coroner has one or more specially appointed physicians, it is not considered absolutely necessary that the jury should personally view the body, as it is regarded as sufficient if the body has been identified by the examining physician and the autopsy reported by him.

In holding this judicial inquiry into the cause of death, it is an essential and inseparable part of the coroner's investigation that a postmortem examination be made. Whether such examination should take place before the coroner has empanelled his jury would depend upon whether or not this examination is made by a coroner's physician, who may act, *per se*, in viewing the body for legal purposes. If the jury is to view the body, then the autopsy should not be made until after such view, as the jury should see the body in the same condition as it was when found. However, this autopsy should in no case be performed when the jury is present. If there be no legally authorized coroner's physician to conduct such an examination, then the coroner is empowered to avail himself of such professional skill and aid as he may deem necessary to solve the question at issue, namely, the cause of death. His contract will, therefore, bind the county, in which the investigation is held, to the payment of all fees connected with the inquiry. Likewise, should no sufficient cause of death be shown by the autopsy or should poisoning be suspected in the case, the coroner may order a toxicologic examination of the organs, holding his further inquiry until the report of such investigations becomes available.

The coroner's jury consists of a few men (the number varying in different states) selected from those living in the region in which the inquest is held. The jurors are summoned by the coroner and sworn by him. They are not challengeable. After being sworn they must investigate the circumstances and determine the cause of death, they being the sole arbiters of the facts as found. They must view the body and determine its identity, except where this has been done by legally appointed coroner's physicians, it being essential to the validity of the inquest that the body be viewed. The coroner instructs the jury as to the law and summons any person as a witness who he has reason to believe possesses any knowledge as to the death of the individual concerned. Such summons must be obeyed just as in the case of subpoenas from courts of law. The report of the autopsy and that of the toxicologic or other scientific examination are introduced. Evidence

offered need not be given in the presence of the party suspected of being concerned in the outcome of the case. While the special duty of the inquest is to discover the cause of death, it may often happen that the coroner's investigation may lead to the discovery or suspecting of the individual who may have been accountable for the death. In case the suspicion may point so strongly to some particular person as to warrant it, the jury may find that the death was due to a certain cause at the hands of a certain individual. In such cases the coroner may commit the suspect to prison pending further legal investigation. While the accused has not the legal right to be represented at the inquest by counsel or to cross-examine the witnesses, yet in some cases counsel may question witnesses with the consent of the coroner. After the evidence has been taken the coroner instructs the jury as to the law, and the jury retires to deliberate upon its verdict. During these deliberations the coroner should not be present. The verdict is reduced to writing and must be accepted by the coroner as final. The report of the inquest and the verdict found are then signed by the coroner and the jury.

As stated above, the office of coroner has been abolished in Massachusetts and in certain counties in New York. Medical examiners take the place of coroners. These examiners cannot hold an inquest, this function being exercised by a justice of the district, police, or municipal court for the district or city in which the body lies, or by a trial justice. One of these officers holds the inquest on being notified by a medical examiner that, in his opinion, a death was caused by violence. The medical examiner has no power to hold an autopsy without being so authorized by the district attorney, mayor, or selectmen of the district, city, or town where a dead body lies. On notice being given to a medical examiner that there is a dead body lying within his district, which is supposed to have come to its death by violence, he should go to the place and take charge of the body. If he believes examination necessary, he must obtain authorization, as above, to conduct the same in the presence of two or more persons, whom he may summon to appear. After his inquiry into the cause of death and the circumstances surrounding it, he makes his written report covering all details of his investigation. Should he believe that a toxicologic or other scientific examination is necessary, he may employ a competent person to conduct it, making the report of the scientific examination a part of his own.

It is to be mentioned, in passing, that the effect of a coroner's verdict is merely to indicate the opinion, based upon the evidence introduced, that the deceased came to his death from certain causes either at the hands of known or unknown parties. At common law a coroner's inquisition, charging one with homicide, had the same effect as an indictment. In the United States, however, this mode of prosecution is not now recognized; but after the inquest and return an indictment must be found or information filed, according to the practice in the particular jurisdiction. No person can be tried upon a coroner's verdict, a further step being necessary before trial is possible.



**2. Indictment or Presentment by Grand Jury.**—An *indictment* is a written accusation of a crime drawn up by the public prosecutor and submitted to the grand jury (see below) and by them found and presented upon oath or affirmation as a true bill. At common law an indictment will lie for all treasons, felonies, and misdemeanors. It will also lie for any offense created by statute, whether a felony or merely a misdemeanor, unless the statute points out some other mode of prosecution or proceeding. Usually an indictment will lie even though an information is also permitted, but sometimes the statutes require certain offenses to be prosecuted by information, or in some other special mode, and an indictment therefor will not lie.

A *presentment* is the notice taken by a grand jury of an offense from their own knowledge or observation, or of their own motion on information from others, without any bill of indictment having been submitted to them by the public prosecutor. In the practice at common law and under some of the statutes it is regarded as nothing more than instructions by the grand jury to the public prosecutor for framing a bill of indictment, which, being prepared by him, is submitted to them and found a true bill. The presentment, merged in the indictment, ceases and becomes extinct, and the indictment becomes the basis of the prosecution. In some states grand jurors are by statute expressly empowered to make presentments of offenses which are within their own knowledge or observation or are of public notoriety and injurious to the entire community; and in some states they have such power, as at common law, independently of any statute. In other states they have no power to present for a crime except by indictment. In some jurisdictions a presentment is not only allowed, but is given the same effect as an indictment, so that the accused may be arraigned and tried thereon, without any indictment being preferred and found.<sup>1</sup>

In some jurisdictions by statute, as at common law, all felonies must be prosecuted by indictment, while misdemeanors may be prosecuted either by indictment or by information. Some of the states, however, have departed more or less from the common law acceptance and specify either one or both procedures for certain crimes. In many jurisdictions an indictment or presentment by a grand jury is expressly required in the case of certain crimes by constitutional provision, and in such cases a prosecution in any other mode, even under legislative sanction, is unauthorized. Such is the case under the declaration in the constitution of the United States that "no person shall be held to answer for a capital, or otherwise infamous crime, unless on a presentment or indictment of a grand jury, except in cases arising in the land or naval forces, or in the militia, when in actual service in time of war or public danger." This provision applies to prosecutions in the federal courts and in the territories and the District of Columbia; but it does not apply to prosecutions by the states, and therefore it does not prevent a state from authorizing prosecutions, even for capital felonies, by information instead of indictment. When there is no special con-

<sup>1</sup> Cyclopaedia of Law and Procedure, 1906, XXII, 175.

stitutional provision like that referred to above requiring indictment or presentment, or if the case does not fall within the provision, misdemeanors and even felonies, including such as are capital, may be prosecuted, if authorized by statute, by information or complaint and without the intervention of a grand jury.

Should the coroner's jury find that the probability exists that a crime has been committed, the matter is referred to the district or state's attorney, who draws up a bill of indictment, which sets forth the nature of the crime and the name of the suspected person. This bill is submitted to a special body of persons, called a grand jury, consisting of not less than 12 nor more than 23 members, whose duty is to ascertain whether there is sufficient ground of suspicion of any person to justify trial by a petty (petit) jury. The grand jury itself by presentment and the prosecuting attorney by information may, also, bring such matters before the grand jury for consideration. This jury deliberates in secret, calling such witnesses as may throw light on the case at issue and paying special attention to the evidence as given by the ones making the postmortem, toxicologic, or other scientific examinations. If the jury decides that the evidence justifies a trial in open court, the indictment is returned to the district or state's attorney marked "true bill"; but if not so regarded the bill is "ignored." A true bill leads to a trial, but it must be remembered that this does not presuppose the person indicted to be guilty, as the function of the grand jury is not to determine the guilt of a person accused. In his examination before the grand jury the witness is not subjected to cross-examination, as his function here is merely to present his evidence as to fact and his deductions therefrom. The accused is not represented by counsel and has no opportunity of introducing evidence beyond what he may personally care to offer.

**3. Information.**—An information is a written accusation of crime preferred by the public prosecutor without the intervention of the grand jury. The prosecutor may act on information which he himself has that a crime has been committed, or on information which he obtains from one or more reputable citizens. At common law an information will lie for any misdemeanor, but not for a felony. In many jurisdictions there are constitutional provisions which prevent prosecutions by information for capital or otherwise infamous crimes, or for felonies, or for crimes subject to certain punishment, and in some states there are such provisions preventing prosecution by information for any crime, whether a felony or misdemeanor, except petty offenses cognizable by justices of the peace or police magistrates; but if there is no constitutional provision in the way, the legislature may authorize any crime to be prosecuted by information. Where a statute authorizes prosecutions either by indictment or information, the state may choose either mode, but cannot prosecute by both at the same time.<sup>1</sup>

**4. Complaint or Affidavit.**—A complaint or affidavit, as distinguished from an information, is a written accusation of crime made by

<sup>1</sup> *Cyclopedia of Law and Procedure*, 1906, XXII, 188.

a private individual, or by an officer other than the public prosecutor. This is the foundation of the jurisdiction of the magistrate. This procedure performs for the magistrate's court the same office that an indictment or information does in superior courts. In absence of statutory requirements to the contrary, a complaint may be made by any person who legally can be a witness and who has knowledge or information of any violation of the criminal law. This rule permits a wife to be the complaining witness against her husband.<sup>1</sup> The filing of the affidavit, naming the offense and the person charged with its commission, is the first step in giving a justice of the peace or other examining magistrate jurisdiction over the person of one charged with a violation of the criminal law. If the magistrate is satisfied that there are reasonable grounds for believing the charge, he may issue a warrant of arrest. The presence of the accused is not required during an investigation to determine whether or not a warrant shall issue. In most jurisdictions a complaint or affidavit is the proper form of accusation for the prosecution of petty misdemeanors; but it will not lie for a felony, nor as a rule for misdemeanors in the higher courts of criminal jurisdiction, except under express statute. After the issuance of the warrant of arrest and after the appearance of the accused before him, the magistrate may then proceed to hold a "preliminary examination," which has a three-fold purpose: (1) To inquire concerning the commission of crime and the connection of the accused with it, in order that he may be informed of the nature and character of the crime with which he is charged and whether there is probable cause for believing him guilty; (2) to preserve the evidence and keep the witnesses within the control of the state; and (3) to determine the amount of bail to be allowed. A preliminary examination is not a trial. The only issue tried by the examining magistrate is whether there is a *prima facie* case established. If the magistrate is satisfied that there are reasonable grounds for believing the charge, he may bind the accused over to appear at a certain term of a particular court to answer the charges against him or he may commit the accused to jail. No preliminary examination of the accused is necessary where an indictment has been found against him by a grand jury. Sometimes, however, a statute or practice requires a preliminary examination and a commitment or binding over to authorize an indictment in a particular court.

**The Trial.**—The trial of the person is conducted in open court before a judge and a petty (petit) jury usually composed of 12 members. In the selection of the jury, from the men and women called for jury service, the attorneys for both sides carefully question each one presented and either accept or reject them. After the selection of the jury, this body is sworn by the judge, the indictment is read in open court, and the accused is required to plead "guilty" or "not guilty" to the charge.

To this trial the medical witness is summoned by subpœna, which must be obeyed. If he be an expert witness, the subpœna is usually

<sup>1</sup> Corpus Juris, 1918, XVI, 290. .



dispensed with, but it may be served upon him. It is here that he will be subjected to a strict and severe examination as to his facts and his deductions from his own facts or those introduced by others. In his direct examination he should make his points clearly and decisively, confining himself to his facts and never making deductions that are not warranted by such facts. The rules previously laid down should be followed by him with great care and exactness. In his cross-examination he will need all his mental acumen and should not be led by the opposing attorney into making statements which are unwarranted or are not absolutely true in every sense of the word.

After having heard the evidence introduced by the prosecution and the defense and listened to the closing arguments of counsel, the jury is instructed by the judge as to the law in the case. After this procedure it retires to consider its verdict, upon the result of which will hang the fate of the accused, the verdict of the coroner's jury and the indictment of the grand jury being either substantiated or disproved.

**Dying Declarations.**—From the nature of his professional duties, it not infrequently happens that the attending physician comes into possession of facts that are unknown to others and which may prove to be of great importance in solving the question of guilt. Even before any suspicious circumstances have come to light, a physician may be summoned to a person who has been suddenly attacked or seized with a severe illness. Such a patient, believing himself about to die and that his recovery is impossible, may make to the physician certain statements as to the circumstances surrounding the infliction of a wound or the administration of a poison, and may, also, mention the names of the person or persons believed by him to be concerned in the assault or the poisoning. Such statements are known as "Dying Declarations" and are received in evidence without being sworn to, the law assuming that the person making the statement has in his mind at the time of making it the conviction of impending death and that such statements have the force of those taken under oath as to truthfulness and sincerity. In prosecutions other than for homicide or abortion, the dying declarations of the person injured are not admissible as such; and even in prosecutions for homicide statements of the deceased made after receiving the fatal wound, but not under such circumstances as to be admissible as dying declarations or as part of the *res gestæ*, may not be received either for or against accused.<sup>1</sup> If time permits, it is wise for the attending physician to summon one authorized to take depositions so that the statements may be formally taken down. If, as often happens, such statements are made at a critical period, the physician and, possibly, some member of the family may be the only ones present, so that it devolves upon the physician to take down at once the actual words used by the dying person. No attempt should be made by him to interpret the statements or to introduce words other than those actually employed by the one making the statement. The phys-

<sup>1</sup> Corpus Juris, 1918, XVI, 640.



ician should receive that which is voluntarily uttered and question the patient only for the purpose of explaining ambiguous or contradictory statements. If possible, the person making the statement should sign the subject matter written down by the physician. After receiving such declarations, it is the duty of the physician to place the statement in the hands of the coroner or the state's attorney for their information in the investigation of the case.

**Privileged Communications.**—In the course of their relations with their patients physicians not infrequently receive private and confidential communications regarding matters which may or may not be pertinent to the treatment of the case in hand. Such communications or information may, however, become very pertinent in judicial investigations, so that this close relationship of physician to patient may assume the greatest importance. Such communications of a private or confidential nature, made by a patient to a physician, have been called Privileged Communications, although the common law concedes no special privilege of this sort to physicians. According to the common law, no medical man can claim exemption from answering a question because the answer might involve a violation of secrecy or might implicate the character of a patient, although he may refuse to answer it, if, in so doing, he incriminates himself. In some of our states such a communication is, however, excluded from introduction into evidence "because greater mischiefs would probably result from requiring or permitting its admission than from wholly rejecting it." In New York, for instance, according to Section 834 of the Code of Civil Procedure, "A person duly authorized to practice physic or surgery shall not be allowed to disclose any information which he acquired in attending a patient in a professional capacity, and which was necessary to enable him to act in that capacity." According to Section 836 of the Code of Civil Procedure of New York, as amended in 1892, "The last three sections apply to any examination of a person as a witness unless the provisions thereof are expressly waived upon the trial or examination by the person confessing, the patient or the client. But a physician or surgeon may, upon a trial or examination, disclose any information as to the mental or physical condition of a patient, who is deceased, which he acquired in attending such patient professionally, except confidential communications and such facts as would tend to disgrace the memory of the patient, when the provisions of Section 834 have been expressly waived on such trial or examination by the personal representative of the deceased patient, or if the validity of the last will and testament of such deceased is in question, by the executor or executors named in said will, or the surviving husband, widow, or an heir-at-law or any of the next of kin of such deceased, or any party in interest." Such provisions as the above are found in many states, but in many of the other states there are no statutes restricting the nature of the disclosures which a physician may be compelled to make in a court of justice. The protection, it will be seen, is more in the interest of the patient than of the physician. The witness must know the law of the

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state in which he is testifying before he claims the protection that his information is in the nature of a privileged communication.

It is undoubtedly true that the honorable physician will never under any circumstances, unless waiver of the privilege be made by his patient, reveal the confidence of his patient and that he will always preserve inviolate every secret and confidence obtained in the course of his professional practice. In doing so and in refusing to answer questions involving what he believes to be a matter between himself and his patient, the witness must remember that he may be punished for contempt of court for such refusal. However, he is rewarded by the knowledge that he is placing the interest of his patient beyond personal considerations and has lived up to the highest ethics of the profession by keeping such secrets inviolate.

# LEGAL RIGHTS AND OBLIGATIONS OF PHYSICIANS

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THESE relate to questions of civil and criminal malpractice, the former growing out of contractual relations of physician and patient to which is added a discussion of the rights and liabilities of third parties.<sup>1</sup>

**The Right to Practice Medicine.**—This was originally a common law right. Succor, aid, and medicine could be given by anyone who thought he was competent and he could hold himself out as a curer of the sick the same as a man could follow any other occupation. In England in the sixteenth century there began to be some limitation. It was required that those proposing to practice medicine should register with the bishop of the diocese. Laws were later enacted requiring that those proposing to practice medicine should be registered, and precedent to this they should pass an examination. In the United States nothing very definite was done in most states until the middle of the nineteenth century, when state licensure was generally adopted. Practically all states of the American union now have laws relative to the licensing of physicians to practice medicine. The constitutional validity of these laws has been in the main sustained. They are enacted under the police power, which is held to include the protection of lives, limbs, health, comfort and convenience, as well as the property of all persons within the state. The statutes of the several states vary in their terms and from time to time are subject to change. The majority of these statutes direct the licensing of physicians after an adequate examination and direct that the license shall be registered in the county in which the individual practices. In some states there is provision made for reciprocity in registration; others do not have this. In many states there is a distinct exemption for consultations and in a general way there is permission given for the practice of medicine by legally qualified practitioners of other jurisdictions, providing they do not establish a domicile nor have an office in the state in which they propose to practice. The judicial construction which has been given these statutes by the courts of the respective states is generally based upon the particular wording or meaning of the statute and is ordinarily of little interest outside of the state in which it is rendered.

**Definition of Medical Practice.**—Considerable difficulty has obtained in defining what was meant by the term "practising medicine."

<sup>1</sup>The writer wishes to acknowledge the assistance afforded by the legal briefs of the Medical Protective Co., of Fort Wayne, Ind.

The most generally accepted statement is that it is to apply to those who treat, operate on, or prescribe for one afflicted with disease. Such a definition is, of course, inadequate, but under it the courts have decided in a general way that the popular notion of who is practising medicine prevails; namely, someone who professes to be a physician and who operates on and treats the sick. Under this heading it has often been held that a Christian Scientist was a practitioner of medicine; also chiropractors, osteopaths, etc. In an early Alabama case the evidence showed that the defendant, who was charged with the illegal practice of medicine, was called doctor by his neighbors, and that he was called upon to treat a sick child, and he gave the child some herbs which he had gathered in the woods. He made no charge for his services, but he was convicted in the lower court. This finding was, however, reversed, the court stating that it was the duty of the judge to instruct the jury as to what constituted the practice of medicine in order that they might properly judge the facts that were before them. The court further held that where a person did not solicit patronage and did not hold himself out as a physician, but simply advised the giving of medicine to a sick person, was not practising medicine within the meaning of the statute. Special emphasis was laid on the fact that he did not expect compensation. Most of these statutes have some provision regarding emergency treatment and what constitutes emergency relief.

As a rule the boards have the power of revocation of license for unprofessional conduct. A very interesting case arose in Montana in which a physician had attended a woman for a premature birth and had delivered a fetus about seven months old. He concealed the name of the woman and placed the fetus in a furnace, it was claimed, with the intention to destroy the same and conceal its birth. At the coroner's inquest over the fetus the defendant testified the woman had miscarried and that on the following day he would disclose the name of the woman who had given birth to the fetus. The next day before the coroner he refused to disclose the name on the ground that she had left the state and the information might incriminate him. The Board of Medical Examiners revoked his license, from which finding he appealed to the district court, where the action of the Board of Examiners was sustained, and later to the Supreme Court, which reversed the findings. In discussing this case the Supreme Court said that the complaint nowhere alleged that the miscarriage was procured by the defendant nor that he had been guilty of any criminal act. When the fetus came into his possession it was his duty to dispose of it in some sanitary way. His concealing the name of the woman was in pursuance of what was his clear duty. The decision was not based on whether the doctor had the legal right to suppress the name of the woman or to so dispose of the fetus, but the revocation of his license was based on the judgment that in so doing he had acted unprofessionally and dishonorably. The court held that the refusal to give the mother's name was consistent with that of an innocent man made overcautious by fear that his actions would be liable to judicial investigation. It is the policy of the law to



protect the physician from arbitrary or unjust treatment by examining boards and this must be followed not only in granting licenses but in their revocation.

**Contract of Physician with Patient and Patient with Physician.**—Most of the relations of the physician grow out of the contractual relation between these parties. A contract is an agreement upon sufficient consideration to do or not to do a particular thing. It may be expressed or implied. If in writing, as may sometimes happen, the terms are set forth and can be properly adjudicated. The majority of contracts between the physician and patient arise from the implied relation of the parties. The implied contract becomes operative by merely undertaking the treatment of a patient by the physician. By this he is bound to have ordinary skill and to exercise due diligence in its application. This is irrespective of his license to practice and was in operation long before statutes were passed defining and regulating the practice of medicine. It was a common law contract and is no way altered by his status as a registered practitioner. In defining this skill that the physician should have, various terms have been used, such as proper, reasonable, and ordinary. In judging this degree of skill the general knowledge of the profession is to be taken into consideration; also the location in which the physician practices, it being assumed that those in the large centers of population with abundant hospital facilities would possess a greater degree of skill than those practising all branches of the profession in sparsely settled communities. This contract is applicable to anyone who acts as a physician whether registered or not. If he professes to be a regular qualified physician or surgeon, he is held to the same average accountability as those who are registered. His failure to exercise such skill or diligence makes him responsible in damages to the extent of the injury due to his incompetency or want of care. It is required of the physician that not only shall he possess ordinary skill, but that he should use due care and diligence. It is obvious that he may be ever so skilful, but if he does not exercise his skill he has not fulfilled his contract. No absolute rule can be prescribed. In one case what might be ordinary care would in another case be gross negligence. It is a question of fact to be determined in each particular case after a consideration of the attendant circumstances. The degree of care is not of necessity proportionate to the injury; such a test would be manifestly beyond the possibility of human acquirements. The refusal of the assistance of another physician does not increase the liability, but it simply amounts to a declaration that the physician himself possesses the ability to deal with the case.

The fact that the services are gratuitously rendered does not alter the relations of this contract. "Whether the patient be a pauper or a millionaire, whether he be treated gratuitously or for reward, the physician owes him precisely the same measure of duty and the same degree of skill and care. He may decline to respond to the care of a patient unable to compensate him, but if he undertake the treatment of such a patient he cannot defeat a suit for malpractice nor mitigate

a recovery against him upon the principle that the skill and care required of a physician are proportionate to his expectation of pecuniary recompense." This rule is subject to the limitation that the one who undertakes the gratuitous treatment must profess to be a physician. The physician contracts to use his best judgment and to follow established modes of practice. It is this latter assumption that admits of such wide latitude. If it were strictly adhered to, it would result in confining the practice of medicine to stereotyped procedures. Nevertheless, it has been held in most courts that if a physician experiments with some untried method of treatment he does so at his peril. He must be able, in case of deleterious results, to satisfy the jury that he had reason for the faith that was in him and to justify his experiments by some reasonable theory. As part of this duty it is necessary for the physician to instruct the patient and the nurse. This contract of the physician and patient never goes so far as to amount to guaranteeing that the physician will effect a cure or even benefit his patient. A physician may enter into such a contract providing that he shall be paid only in case a cure is effected, and such contract would be binding even though no definite sum was named. Likewise, a physician may limit by special contract his undertaking to a limited period of attendance. If, however, he does not limit his attendance his decision to discontinue visits must be accompanied by such reasonable notice as would enable the patient to supply his place. Such contracts include all medical services, including surgical operations, if such should be necessary, providing there had been no special understanding to the contrary.

Such a contract is mutual. It binds the patient as well as the physician. When a patient accepts the services of a physician the patient contracts to pay the physician a fee. The obligation that makes it necessary for the physician to continue the treatment also makes the patient liable for the subsequent visits. The patient is, also, liable for the services of a consultant, even though he had been summoned by the attending physician. This arises out of the natural presumption that the consultation is for the benefit of the patient. It is the duty of the patient, after he has placed himself in the hands of a physician, to follow his instructions, assuming that they are such as would be given by an ordinarily skilful practitioner. It follows, therefore, if a patient endeavors to recover damages from a physician, that the physician may show such negligence or disobedience.

**Third Parties.**—A general proposition of law is that parents must provide for the maintenance of minor children. If a child is away from home and is under age, even though he is not under the immediate direction of the parents and is perhaps earning and spending wages which he earns and applies to his support, this does not constitute such complete separation as would release the parent from liability to a physician who attended the child in sickness. The circumstances would be different if the child had left contrary to the father's will. The same rule is applicable as to the father, excepting that where the child has a separate estate the mother would not be liable. In cases where the parents are sepa-

rated the liability for medical services would then have to be determined by the circumstances of the individual case. Where the parents are divorced and the custody of the child is with the mother, in some states the father would be liable and in others not.

When a child becomes of full age a different rule attaches. The parent is then under no special obligation to furnish necessities even though the child remains in the father's house. Circumstances may raise the implication of an agreement, but the law places no greater burden on the father than it would upon a friend or acquaintance. It thus happens that the request by a father to a physician to attend a son of full age raises no implied promise on the part of the father to pay such services. Mere acquiescence is not usually sufficient to involve legal responsibility for compensation.

The liability of husband for necessities furnished to the wife is more definite. In cases where the husband and wife are living apart and the former provides for her support, he becomes liable for services rendered by a physician at the request of his wife. The same rule of liability holds where a man holds himself forth as the husband of a woman, though in fact they are not married.

A master is not bound to pay for medical attendance to a servant unless the physician is called by him. The master's wife cannot bind the husband under these circumstances, unless it can be shown that the agreement to pay for the medical attendance of the servant was with the knowledge and consent of the husband. The liability of a party asking a physician to attend another can only be determined by the circumstances of a particular case. The question of liability in such cases often turns on whether the individual who summons the physician was acting merely as a messenger. In some instances arising under such circumstances it may happen that there is a liability for the first visits, but not for subsequent ones, after the physician has an opportunity to make a contract with the person who requires his services.

A prolific source of litigation arises from the liability of a corporation which, through an agent, has requested the services of a physician. Under such circumstances and in a general way the agent may bind the corporation for the immediate service. Later attendance must be ratified by someone having authority to speak for the corporation. This is based on the general rule of law that one who deals with an agent is bound to know the extent of the agent's authority. Where the injured person himself summons the physician, the contract is with the patient alone, even if a responsible employee of the corporation should call on the patient and tell him that he should summon a physician and that the company would pay the bill. Such an arrangement is no contractual relation between the physician and corporation. Where a corporation employs a physician and reserves the right to determine what is reasonable compensation for such services, the corporation has the right to impose this restriction as there was no primary liability, and it has a right to afford aid under such terms as it sees fit. It would appear as if any servant of a corporation in an emergency may bind the cor-



poration for immediate aid, but such obligation does not extend beyond the immediate circumstances giving rise to it. Further services may be ratified by a responsible officer of the company.

The liability of counties and towns varies so much in the different states that no general rule can be laid down. In some there is an express statute obligating the counties to pay for emergency service; in others there is not. In some states there is a liability created where a coroner requests a physician to perform a postmortem examination; in others recovery cannot be had for such services.

Among the rights of third parties are those which relate to the husband where the wife is in need of an operation. Her consent must be obtained or it may be implied by the circumstances. A physician operated upon a woman for a cancer of the breast where the husband had previously placed the wife in his care under the supposition that the disease was not cancer. Here the liability of the husband was fixed by the circumstance that the wife might reasonably have been expected to inform her husband of the situation. Where a husband or a wife dies, the survivor has the right to possession of the body for purposes of interment. Should the physician violate this right and perform an autopsy without the consent of the husband or the wife, the physician would be liable in damages. The same would be true in the case of the death of a child, the parents or the next of kin having the same right of possession of the dead body. Where an inquest is necessary and an autopsy is performed by the coroner, the physician is protected in so doing if he treats the body properly and does not wantonly or unnecessarily disfigure it.

**Right of Compensation.**—This arises out of the contractual relation of physician and patient. Occasionally a contract may be a verbal one, more rarely in writing, but in the great majority of instances it arises out of the acceptance of his services by the patient. Where a physician is summoned to attend a case and he responds promptly only to be told that the emergency for which he was summoned is past, or that another physician has been employed, the patient is liable for the service. A physician may charge for the services of a student or an assistant, and irregular practitioners, such as Christian Scientists, may recover providing such service is not specially interdicted by statute. In one case it was interposed that Christian Science was a delusion and that its principles and methods were absurd. The court held that evidence of that sort was immaterial and that they were not required to investigate the merits of Christian Science. The patient chose the treatment, received it, and promised to pay for it, and they found that there was nothing unlawful or immoral in such contract. The wisdom or folly of such a contract was not for the court to determine.

As to the rate of compensation decisions have markedly varied. In a general way courts have held that the value of an estate has something to do in fixing the amount of the physician's fee where the suit was against the estate. On the contrary, courts have repeatedly held

that the wealth of the patient was not to be considered where the suit was brought by the physician against the patient. In the case of ordinary and usual services the recognized customs prevailing at the time and place are the ones which govern. If he is called from a distance or there are unusual circumstances, these are to be taken into consideration.

A consultant's fee is to be paid by the patient. An agreement between the patient and the attending physician that the latter is to pay the consultant's fee is not binding on the consultant unless it is known to him. Not every visit of a physician with his associate is to be regarded as a consultation unless it is at the express request of the patient. Where two physicians are jointly in attendance and they happen to make their visits at hours which coincide, such attendance is not to be regarded as a formal consultation.

The fact that the patient is not benefited by the treatment is no bar to recovery. "A physician is not an insurer of the success of his treatment and is entitled to pay for his services whether he succeeds in curing his patient or not, providing he uses the skill of an ordinarily skilful physician." A treatment of the patient for the wrong disease does not bar recovery of fee providing the physician exercises proper care and skill. If the patient contests the right of recovery of a physician because of his neglect or incompetency, it is incumbent upon the patient to prove that the amount of damages he sustained because of such want of skill is an adequate offset to the physician's bill. In cases where a physician agrees to cure a patient, otherwise no charge will be made, it is incumbent upon him to prove that a cure was actually effected. If he is able to do this he is entitled to recover for any special amount that was stipulated for the cure. Where no amount is named usual and customary fees for such services at that time and place can be recovered. Intoxication on the part of the physician to a degree that would prevent his exercising proper care and skill would act as a bar to recovery of compensation, but where a patient continues to employ a physician while the latter is intoxicated the condition would not be a bar to recovery. If a poor person is attended by a physician, who subsequently renders a bill to a municipality for such service and is paid any part of the bill, he cannot subsequently demand payment from the patient.

No question is more trying to a physician than that of attendance as expert witness without special compensation. In many states there are statutory provisions for the summoning of expert witnesses and some of them prescribe the rate of compensation. Where no such provision exists the rule has been that he must attend on an ordinary subpoena and give such facts as are within his knowledge or opinions such as he may have previously formed or expressed. He cannot be, however, required to make any examination into the facts of the case, nor can he be compelled to listen to testimony and pass his judgment upon it. In many states at least it is not required of him that he listen to hypothetical questions and formulate an opinion, as this has been held to require special service of him because of his profession which does not devolve upon citizens in general. The physician cannot enter into a

pecuniary arrangement for attendance as a witness and to give expert testimony in a case based on a sliding scale of compensation predicated on the amount recovered. Where a definite arrangement is made with a physician to secure his services as an expert witness, but no definite arrangement is made as to the fee, a reasonable sum for the service can be recovered.

A physician's right to recovery of compensation is, of course, based on his legal qualifications as a practitioner. If it should appear that he did not have a license or it was not properly registered in the county in which he practised, there would be no right of recovery. This rule would apply to a physician legally registered in one state, but attending a patient in an adjoining state, providing, of course, the service did not come under some exemptions of the medical practice act relating to consultants or to single visits or operations. It would, of course, have no bearing in case a physician was summoned from an adjoining state by the patient. In all actions for recovery of fees physicians must assert that they are legally qualified practitioners; they must offer proof of employment and, also, as to the nature and extent of the services. There is no presumption of law as to the value of a physician's services, but he may testify, where the patient is alive and of sound mind, of the value of such services. In case the suit is against a deceased person, he must offer evidence by a medical man conversant with the facts or one who has knowledge of the usual and customary charges for physicians at that time and place.

## MALPRACTICE

**Civil malpractice** may be defined to be the failure, to the damage of the patient on the part of a physician, surgeon, or dentist, to exercise that degree of care, skill, diligence, and judgment that the law requires. The gist of such an action is negligence. Judge Cooley, in his work on "Torts," says that the liability of a physician and surgeon is not different from that of an attorney or other professional person. He holds that the rule which had been laid down in a Pennsylvania case, that the skill and diligence required in such occupation should be such as were possessed by one thoroughly educated in his profession, is too severe, and he adopts the language of a New Hampshire decision as more correctly stating the undertaking of a practitioner:

"By our law a person who offers his services to the community generally or to any individual for employment in any professional capacity as a person of skill contracts with his employer:

"1. That he possesses that reasonable degree of learning, skill, and experience which is ordinarily possessed by the professors of the same art or science and which is ordinarily regarded by the community and by those conversant with that employment as necessary and sufficient to qualify him to engage in such business.

"2. That he will use reasonable and ordinary care and diligence in the exertion of his skill and the application of his knowledge to accom-



plish the purpose for which he is employed. He does not undertake for extraordinary care or extraordinary diligence any more than he does for uncommon skill.

"3. In stipulating to exert his skill and apply his diligence and care the medical and other professional men contract to use their best judgment."

This, according to Cooley, is believed to be an accurate statement of the implied promise. The practitioner must possess at least the average degree of learning and skill in his profession in that part of the country in which his services are offered to the public; and if he exercises that learning and skill with reasonable care and fidelity he discharges his legal duty.

"To exact more than this," says the court in *Martin vs. Courtney*, 87 Mimm., 197; 91 N. W., 487, "would be an unjust imposition upon the physician, to encourage expectations of miraculous power that could not be fulfilled, for he is not an insurer of absolute success. The white headstones and monuments that glisten in the sunshine within the sacred precincts devoted to the repose of the dead in the suburbs of every city and hamlet in the land testify with unerring certainty that man is mortal, and the most effective efforts of the healing art are incapable of resisting the conqueror of all. The very best results of science recognize this truth. The medical art of late years has made great advances in resisting the ravages of disease, but it has its limitations, and its achievements are still but an approximation to its highest ideals. It is perhaps unfortunate for the profession that too much is expected from it. Confidence in the physician by the patient is essential, but it should not be such an unwaivering faith in his powers as the superstitious savage gives to his medicine man, or makes success the sole metewand of duty, but rather a sensible and an intelligent trust that expects reasonable efforts, and, when these have been bestowed, submits with Christian resignation to the inevitable; for 'he censures God who quarrels with the imperfections of man.' The ubiquitous protectorate which jurisprudence extends to all material interests and to every science and to every art takes note of our common fate, with the possibilities of failure in the professional treatment of disease, and accords the medical practitioner in every case the presumption that he has done his whole duty."

If, in the language of the latter quotation, there is a presumption in each case that the practitioner has done his whole duty, it is obvious that, in order to maintain action for malpractice, it is necessary for the plaintiff to show that the physician did not exercise such reasonable skill and diligence as the law requires, and such evidence must be introduced by those who have special and expert knowledge of the matter in hand. The questions presented for determination are questions of science and, in order to pass on the propriety or impropriety of the defendant's treatment, expert medical evidence is imperative. The practitioner is not to be looked upon as a miracle worker, but he must be regarded as one possessing human limitations. If in his practice he is guided by standards of the profession which are accepted, he has

fulfilled his legal obligations. The defendant's liability does not rest upon standards created by usual activities and information, but does rest upon the application of scientific principles of the practice of medicine. He is required to have the skill and exercise the care of the average of his profession. If he is a specialist he is grouped with specialists and judged by the average skill and care of specialists. While he is required to exercise his best judgment under all circumstances, he is not liable for error of judgment providing he has exercised proper care in arriving at such judgment.

**Refusal to Take a Case.**—There is a popular notion that a physician is bound to treat patients, respond to the calls, or give aid to the injured, providing he is requested so to do. In law there is no foundation for such belief (*Hurley Adm. vs. Eddingfield*, 156 Ind., 416). He may stand by an injured person while his life blood ebbs away and decline to aid the injured person. By so doing no legal liability is created. He may refuse to respond to the call of a patient urgently in need of medical or surgical assistance, even though he is the only physician or surgeon procurable, providing that the relation of physician and patient does not exist at the time the call is made.

Having assumed charge of a case he immediately sets in operation certain legal presumptions.

**Implied Contract.**—A physician or surgeon undertaking charge of a case impliedly represents that he possesses and will exercise that reasonable or average degree of learning and skill which is ordinarily possessed and exercised by physicians and surgeons of ordinary and average learning and ability in the same or similar localities to that in which he practices, and that he will use reasonable and ordinary diligence in the exercise of his skill and the application of his knowledge to accomplish the purpose for which he is employed; and that he will use his best judgment in the application of his skill in deciding upon the nature and best mode of treatment. Whether or not the amount of knowledge displayed or the degree of skill, care, and judgment exercised is sufficient in any case to fulfil the requirements of the law is a question of fact for the jury to determine from the evidence produced at the trial.

A distinction is made in limiting the care and skill, some courts holding that the degree must be commensurate with that ordinarily had and used in the same or similar localities. Others hold it is that degree of care and skill which is ordinarily possessed and exercised in the profession. About one-half of the decisions hold to the rule that the care and skill is to be judged by that of the same or similar localities, while an equal number can be found holding that the rule is expressed by stating that such degree of care and skill as ordinarily obtains in the profession.

**Locality of Practice.**—The character of the locality or the neighborhood in which the practitioner exercises his calling has important bearing on the degree of care and skill that is required and in determining what constitutes reasonable care, skill, and diligence, the true test being that which physicians, surgeons, or dentists in the same gen-



eral neighborhood ordinarily have and exercise in like cases. On this proposition there is a long line of decisions.

**Highest Degree of Skill Not Required.**—In the absence of a special contract or agreement a physician is not by law required to possess or exercise the highest degree of learning and is not required to use the highest degree of care and skill. The nature of the injury or condition that he is called upon to treat raises no presumption that he engages for extraordinary skill, diligence, or care. It is precisely in the estimating of this degree of knowledge and skill that the courts have found the greatest difficulty in agreeing. Taylor (*The Law in Its Relation to Physicians*) says: "To place the test as that degree exercised by the thoroughly educated members of the profession would be manifestly unjust to the great majority of physicians and surgeons, while a test requiring only the skill exercised by the moderately educated would be equally unjust to the public. Upon this reasoning the Supreme Court of Iowa placed the test as the average of the skill and diligence ordinarily exercised by the profession as a whole. While this rule is probably a just one and about right in theory, it is doubted whether any practising physician knows what is the 'average of the skill and diligence exercised by the profession as a whole,' and as he is the proper judge as to whether a given act will stand this test, the utility of the rule is doubted."

"While the degree of care necessary to be bestowed in a particular case is governed in a great degree by the requirements of that case, a rule of law demanding that the degree of care and skill required shall be proportionate to the severity of the injury or disease treated would manifestly work a great hardship upon the profession. Such a rule was very wisely and justly reversed by the Supreme Court of Illinois."

The location of the practitioner is obviously of great importance. It would be unjust to hold physicians practising in small towns or rural districts to the exercise of the same degree of care and skill as physicians or surgeons who are practising in a large city. This ruling is, however, subject to some limitations which were expressed by Justice Worden: "There might be but few practising in a given locality, all of whom might be quacks, ignorant pretenders to knowledge not possessed by them, and it would not do to say that because one possessed and exercised as much skill as the other he could not be chargeable with a want of reasonable skill. The best considered rulings hold that the physician should possess such skill and experience and exercise a degree of care such as obtained in *similar localities*."

A case illustrating this rule is that of *Small vs. Howard*, 128 Mass., 131. The plaintiff sustained a severe injury of the wrist in which the arteries and tendons were severed. The defendant, a physician in a country town of about 2500 inhabitants, had the usual experience in surgery of a country practitioner. The plaintiff, being dissatisfied with the result, brought an action for malpractice. The experts gave conflicting evidence; one testified that he did not believe that the average country practitioner would possess the requisite skill to care for such a

wound. The court instructed the jury as follows: "The defendant undertaking to practice as a physician and surgeon in a town of comparatively small population was bound to possess that skill only which physicians and surgeons of ordinary ability and skill practising in similar localities with opportunities for no larger experience ordinarily possess; and he was not bound to possess that high degree of art and skill possessed by eminent surgeons practising in large cities and making a specialty of the practice of surgery. He is not responsible for want of success unless it is proved to result from want of ordinary care and attention, and then only to the extent of the injury caused by his want of skill and neglect, nor for the whole consequence of the particular original injury or disease. He is not presumed to engage for extraordinary care and diligence."

Upon appeal this instruction was sustained by the Supreme Court.

**Treatment to Be Tested by the Doctrines of the Defendant's School.**—In determining the qualifications of the physician due regard must be had for the school of medicine in which he practices. The law recognizes that there are different schools of medicine, but it does not favor one school to the exclusion of the others. The treatment adopted by the physician is to be tested by the principles and practices of his school and not by those of another school. An old case is that of *Bowman vs. Woods*, 1 Greene, Ia., 441. It arose from the alleged unskilful treatment of a confinement case by a botanic physician. Another physician was called, who arrived thirty-six hours after the woman was delivered, and the placenta was still in the uterus. At the trial this physician testified that the placenta should have been removed early after the delivery and the delay was likely to produce puerperal fever. The defendant stated that he was a botanic physician and by that school it was considered improper to remove the placenta, which should be allowed to come away spontaneously. The trial court excluded this evidence, which the reviewing court said was error. "The person who employs a botanic practitioner has no right to expect the same kind of treatment or the same kind of medicine a regular physician would administer. The law does not require a man to do more than he undertakes nor in a manner different from that which he professes."

This decision was rendered in 1848, and the court goes on to say: "The people are free to select from the various classes of medical men who are accountable to their employers for all injury resulting from the want of ordinary diligence and skill in their respective systems of treating disease. It is to be lamented that so many of our citizens are disposed to trust health and life to novices and empirics, to new nostrums, and new methods of treatment. But these are evils which the courts of justice possess no adequate power to remedy."

Another case is *Force vs. Gregory*, 63 Conn., 167, in which an instruction was asked for to the effect that the propriety of the treatment was to be judged by the defendant's school of medicine, he being a homeopath. This was refused by the court and instruction was given which was ambiguous, upon which the higher court reversed the case, saying:

"The jury we think should have been told that the relative merits of the two schools were in no sense before them for their consideration; that so far as the defendant was to be judged by either it was by the tenets, rules, principles, and practices of his own school, not by those of another; and, if the defendant adopted a treatment laid down by his own school, the fact that another school prescribed another treatment tended in nowise to show that the defendant was chargeable with lack of skill or negligence."

A long line of decisions recognizes that there are schools of medicine and that the treatment adopted by a physician is to be tested by the principles and practices of his school. It is obvious that this rule was of greater significance a few years ago than it is now. Most of the aspects of surgery are common to all schools, such as the avoidance of infection, the safe administration of anesthetics, etc. It is doubtful if any school of practice would hold that it was proper to leave a sponge in the abdomen of a patient. Nevertheless, the rule has considerable application. It would be unjust to a defendant of the regular school of medicine to be judged by the doctrines and tenets of a chiropractor; hence the law wisely limits the introduction of opinion evidence to members of the same school of practice. In order to constitute a school within the meaning of the law, it is necessary that there should be a body of opinion taught by that school by which a man may be judged. It has been held in a suit against a clairvoyant who claimed as his defense that he treated the patient according to his system. The court upon inquiry found that this system consisted in diagnosing disease by the practitioner going into a sort of trance and, while in this state, learning the nature and extent of the patient's disorder. The court held that this was not a school of medicine. According to such method each individual would be his own judge of the sufficiency and accuracy of this treatment. It would seem as if such a rule might be limited to treatment, but this is too narrow a construction, as the teachings of different schools and their valuation of symptoms and the importance of symptoms vary; consequently it applies to diagnosis as well as treatment, though in one case the contrary was held (*Grainger vs. Still*, 187 Mo., 197). In *Henslen vs. Wheaton*, 91 Minn., 219, it was held that the doctrine of separate schools had no application to the use of the *x-ray*.

**Advanced State of Medical Science.**—Not only must a physician or surgeon possess and exercise the requisite degree of care, skill, and diligence in his diagnosis and treatment, and use his best judgment, but he must also keep abreast of the times and adopt measures approved by the profession. In an early Pennsylvania case, *McCandless vs. McWha*, 22 Pa., 261, it was held that "discoveries in the natural sciences for the last half century have exerted a sensible influence on all the learned professions, but especially on that of medicine, whose circle of truths has been relatively much enlarged, and besides there has been a positive progress in that profession resulting from the studies, experiments, and the diversified practice of its profession. The patient is



entitled to the benefits of these increased lights. The physician or surgeon who assumes to exercise the healing art is bound to be up to the improvements of the day." In *Gates vs. Fleischer*, 67 Wis., 504, it was held that in addition to the skill ordinarily exercised by physicians he must regard the advanced state of the profession at the time of treatment. In *Almond vs. Nugent*, 34 Iowa, 300, it was held that an instruction holding that the physician should be governed by the same rules as mechanics was erroneous. The chief justice, in commenting on one of the instructions, said: "It is clearly objectionable in holding the civil responsibility of the surgeon to be governed by the same rules of law as those that apply to mechanics. Mechanics are answerable for results and the real test of their skill is the success of their work. Not so with the physician and surgeon. They are required to exercise due skill, but are not responsible if the desired result fails. The skilful mechanic will always be successful. The materials which he undertakes to shape and fashion are subject to known laws and are completely under his control. The surgeon and physician apply their skill to human bodies which are subject to laws both physical and mental almost infinite in number, many uncertain and many unknown." In the same case an instruction holding that the surgeon should apply himself to the most accredited source of knowledge was also held to be erroneous for the reason that it implied too high a standard, and for the further reason that while the law requires a surgeon to exercise skill it makes no inquiry as to the source from which it is obtained. It was also held that an instruction holding that a surgeon was liable if he failed to exercise his art rightly and truly was in effect holding him to a degree of accuracy which was incompatible with the present state of medical science. It is impossible for the surgeon or physician possessing even the highest degree of skill always to act rightly and truly as he ought. The practitioner should not be held liable if in the faithful and honest exercise of ordinary skill he fails to use the right remedy.

**Best Judgment.**—It is obvious that if a physician does not possess ordinary skill and attainments he cannot have good judgment. If he does possess average skill he is bound to exercise those attainments according to his best judgment. A physician with the requisite amount of skill who exercises his best judgment is not liable for an error of judgment. Such error must arise from circumstances in which a physician of ordinary skill and knowledge might hesitate. In *Jackson vs. Burnham*, 20 Col., 532, it was held that physicians are not responsible for errors of an enlightened judgment where good judgments may differ. Where there are reasonable grounds for doubt and difference of opinion the professional man, after the exercise of his best judgment, admitting that he possesses the necessary knowledge, is not responsible for errors and mistakes. He is only responsible for the damage resulting from a want of and a proper exercise of reasonable skill and diligence. In *DuBois vs. Decker*, 130 New York, 325, a surgeon relied on a statement that he had treated a crushed foot according to his best judgment. The upper court held that this was not an adequate defense, as evidence had

been introduced to indicate that immediate amputation because of the crushed condition of the foot was indicated. The defendant claimed that he believed the foot could be saved. The court said that judgment must be founded on intelligence, and in order to constitute a defense valid evidence must be introduced to show that there was a reasonable probability that the foot could have been saved.

In exercising his best judgment the surgeon is not bound to foresee any unusual or improbable result of his treatment. Anesthetics kill, ligatures slip, sutures give way, but this is not the usual or probable result.

When a surgeon is called upon to perform an operation which in his judgment is unnecessary he is bound to advise against it whether his opinion is asked or not. If the patient insists on the operation he then sets up his own judgment in opposition to that of the surgeon and the latter can only be held to exercise ordinary care and skill in the performance of the operation. This question was raised in *Gramm vs. Boener*, 56 Ind., 497. The surgeon had set the patient's arm and the result was not satisfactory. The patient insisted that the bone should be rebroken and adjusted. The surgeon advised against the operation. The ultimate result was unsatisfactory and suit was brought, the claim being made that the surgeon should have refused to operate when his best judgment was against the operation. In commenting on this case the court held that when a surgeon is called to advise a patient of mature years and of sound mind that an operation is unnecessary and the patient still insists upon its performance, and in compliance with this request the surgeon does perform it, the court cannot see under what principle the surgeon should be held. "In such cases the patient relies upon his own judgment and not upon that of the surgeon, and he cannot complain of an operation performed at his own instance and upon his own judgment and not upon that of the surgeon."

**Admission of Inadequate Skill.**—A statement on the part of the physician to the patient that he does not possess adequate skill in the treatment of a given condition operates to lessen his liability, but does not excuse gross negligence. Such an admission will not excuse one from attempting to render services or perform an operation in which his skill and experience is thoroughly inadequate for the matter in hand. The circumstances, however, may be such that no other aid is available, and in such case the physician would be justified in going ahead and doing the best that he could.

**Established Practice.**—If there is an established mode of treatment for a given case, the physician departs from it at his own risk. If harm results to the patient from the adoption of a method of treatment not recognized by the profession, he is liable for whatever damage is done. In *Carpenter vs. Blake*, N. Y. 60, Barb. 488, the court held that some standard must be adopted, otherwise the public would be exposed to reckless experimentation. Where a method of treatment is well established it should not be departed from unless the surgeon is prepared to take the risk of establishing the success of his method.



This rule applies only to cases in which there is a settled method of treatment. Where alternative methods are recommended the physician is justified in choosing that which in his best judgment is most advisable. The rule is illustrated in *Jackson vs. Burnham*, 20 Col., 532. In this case the plaintiff claimed that he was suffering from phimosis and the physician applied a flaxseed poultice to reduce the swelling. Evidence was offered that the correct method was to slit the prepuce and relieve the constriction.

**Instruction of Patient.**—It has been held negligent for a physician to fail to instruct a patient so that he could avoid an aggravation of his injury.

**Discontinuing Attendance.**—The implied contract between a physician and a patient can be terminated by the physician only under certain circumstances. If his attendance is no longer necessary, and of this the physician is the sole judge, he can decide to give no further attention to the case. In exercising this judgment he must act in a reasonably prudent and skilful manner. The circumstances of his ceasing attendance must be such that it would appeal to the sound discretion of a reasonably prudent and careful physician. In most adjudicated cases of abandonment there is a conflict of evidence. In *Becker vs. Janinski*, 27, Abb. N. C., 45, it was held that when a physician is called to attend a patient without limitation of time he cannot cease his visits except

1. With the consent of the patient, or
2. Upon giving the patient timely notice so that he may employ another doctor, or
3. When the condition of the patient is such as no longer to require medical treatment, and of that condition the physician must judge at his peril.

In this case the defendant swore that at his last visit he notified the plaintiff that he was going out of town and indicated a physician who would attend in his absence. It was held that if this was proved the physician was not negligent.

Most cases of abandonment have turned on the failure of the physician to visit patients at their homes or in hospitals. In the case of office patients, failure to report at the office by the patient is held to be a termination of the service by consent of the patient. On the contrary, if a patient is treated regularly in the physician's office and he fails to meet the patient at the usual time and place he will be liable for such negligence.

A physician leaving his practice temporarily is bound to use reasonable care and diligence, to notify patients of the intended absence, or to provide a competent substitute to care for his practice during his absence.

**Liability for One Recommended and for Assistants.**—A physician is not liable for the acts of a physician whom he recommends providing the one recommended is in independent practice, and may be properly esteemed as a man of ordinary professional ability and of

proper discretion. In the case of *Myers vs. Holborn*, 58 N. J. L., 193, a physician was engaged to attend a patient in confinement. Shortly before taking a short vacation he visited the patient and recommended a particular physician who should be called if labor supervened before his return. At the confinement the umbilical cord was severed too near the body of the infant and its life was lost. The court held that even if the physician who was recommended was employed by the defendant still no liability was created, as both of them were regularly licensed physicians, and it was held that it was a well settled doctrine that a party employing a person who follows a distinct and independent occupation is not responsible for the negligence or improper act of the other. Such rule has certain limitations and would not be applicable in instances where the physician directly controls and supervises the acts of his colleague. It would also have no application in cases in which there were negligent acts which were permitted to go on without objection or which in the exercise of reasonable diligence should have been observed.

It is a general rule that a physician is liable for the acts of his assistants which are committed in the discharge of the assistant's duties. To have this rule applicable the physician must exercise some control over the assistant. If a surgeon is called into a case to operate and the hospital furnishes nurses and interns, the surgeons exercising no control over such employes, no liability attaches to the surgeon, for their negligence (*Harris vs. Fall*, 111, 177 Fed., 79).

**Gratuitous Services.**—The implied contract that a physician makes with his patient obtains where the services to the patient are gratuitous and are so understood. The rule is not altered if the services are rendered in a charity hospital or dispensary. The rule, however, is only applicable to cases where the defendant holds himself out as a physician and surgeon. If he does so and is an unqualified practitioner, he is held to the same degree of accountability as though he were a licensed physician.

**Consent to Surgical Operations.**—This is a fruitful field of litigation. The general rule is that there is an implied consent to an operation because the patient submits to it. In an operation for appendicitis a physician might discover an extensively diseased ovary and remove it. The patient, on recovering from the anesthetic and learning that the ovary was removed, begins an action against the surgeon, claiming that there was a consent to the removal of the appendix but none for the removal of the ovary. To meet this situation it has been the custom of surgeons to require a written consent for operation. This, of course, does not obviate the liability, but is of value as showing that the circumstances under which the operation was done were explained to the patient. The necessity of some such protection is obvious because the person opening the abdomen cannot be sure just what conditions will be found, nor is he able beforehand to tell just what organs should be removed. It is commonly stipulated in these consents that the surgeon shall have the right to perform such surgical measures as are indicated. In the case of young children the consent of the parent, guardian,

or near relative is necessary. The consent of a husband to an operation on the wife is not necessary.

**Liability for Performing Autopsy.**—A physician, surgeon, or hospital cannot, without express consent of the party who has the right to a dead body, perform an autopsy or mutilate or dissect a corpse unless the same is performed pursuant to lawful official orders or a statute. In the absence of a contrary testamentary disposition, the surviving spouse or next of kin has the right to possession of a deceased's body in the same condition as when death occurred for the purpose of preservation and burial, and this right is infringed upon by one who unlawfully and without cause, order of court, or statutory authority mutilates the body, and damages may be recovered, not as injury to property, but for mental suffering against the wrongdoer (*Foley vs. Phelps*, N. Y. 37, Y. S. 417). Interesting facts were brought out in *Cook vs. Walley* Colo., 27 Pac., 950. It occurred in Denver, where it is required that a physician should issue a death certificate before a burial permit can be obtained. The deceased died on the street and the body was taken to an undertaker's to be prepared for burial. The latter requested the family physician of the deceased to issue a death certificate, whereupon the physician performed a postmortem examination. In this case the court held that the physician was not liable, as the circumstances were such as to warrant him in hesitating to give a certificate required by the ordinance.

The prudent course for a physician is not to perform an autopsy without consent of the relatives or someone who can consent.

**Insanity Inquiries.**—An alienist, in making an examination of an alleged or supposed lunatic or in inquiring as to the mental condition or capacity of a person, is bound to the exercise of reasonable care, skill, and diligence, and to exercise his best judgment in his undertaking. He is not liable for damages because of a commitment unless he fails to use such care in examining, or pronounces a person examined insane or commits the person to an asylum without making a due and proper examination. If he knowingly and falsely signs a certificate of insanity he will be liable. He must be guided by the statutory regulations of his state which must be closely followed.

**Examination Without Consent.**—A physician making an examination without consent of a patient may be liable for an assault. Ordinarily consent is implied by the circumstances, but under other conditions it may not be. Examination of a woman for supposed pregnancy or after an alleged assault, even if requested by a court, does not justify a physician in proceeding in the absence of express consent.

**Hospital Liability.**—A hospital conducted for profit, whether private or general and whether incorporate or not, is liable to a patient who is injured through its want of care or diligence. This liability extends to those in its employ. A patient is admitted to such hospital under an implied obligation that he shall receive reasonable care, skill, and diligence and such attention as his physical or mental condition requires.



The rule regarding charitable hospitals not conducted for profit is different. In the better reasoned decisions it has been held that they cannot be held liable because it would be a diversion of the charitable funds to a purpose for which they were not intended. This rule, however, has been departed from in a number of cases, but these are in a minority and are generally disapproved (*Glavin vs. Rhode Island Hospital*, 12, R. I., 411). The above rule is not changed by the fact that the patient may have paid for the services of the hospital.

A physician or surgeon who treats a patient in a hospital not owned or controlled by him is not liable for the negligent or careless acts of omission or commission of the hospital staff, provided he has no knowledge of such negligence or carelessness and has no control or direction over them or their acts (*Harris vs. Fall*, Ill., 177, Fed. 79).

**Contributory Negligence.**—It is the duty of the patient or those in charge of him to submit to the treatment prescribed by the physician and to follow the necessary or reasonable instructions given by him. If the patient or those in charge refuse to adopt the remedies or comply with the directions of the physicians, or if the patient aggravates the case by his misconduct he cannot charge to the physician the consequences due directly to himself. A party seeking to recover for an injury must not have contributed to it in any degree either by his negligence or the disregard of a duty imposed upon him by the physician. If the contributory negligence of the patient produced the injuries complained of the physician is not liable for damages.

The patient must use reasonable judgment and intelligence in seeking aid of the physician after new developments or failure of improvement, although not instructed by the physician so to do.

**Highest Degree of Care and Skill Not Required.**—In the absence of a special contract or agreement a physician is not by law required to possess or exercise the highest degree of learning, and is not required to use the highest degree of care and skill in order to perform his implied contract. There is no presumption, regardless of the serious nature of the injury or condition to be treated, that he engages for extraordinary skill, diligence, or care.

**Specialist.**—If a physician holds himself out as a specialist in the treatment of a certain organ, anatomical part, physiologic function, injury, or disease, he is bound to bring to the aid of the one employing him as such both in diagnosis and treatment that degree of skill and knowledge which is ordinarily possessed by those who devote special study and attention to that particular branch of the medical or surgical science or the treatment of the particular condition, regard being had to the state of science at the time of treatment.

**Proof of Malpractice.**—It will be seen from the foregoing that the liability of physician, surgeon, and dentist is based upon his possession of ordinary skill, and that, in fact, he has employed his skill in a reasonably diligent and careful manner. There is no implied contract that he will cure or even benefit his patient. The mere fact that his disease is not cured or that his broken leg is not as good as before is no evidence

of malpractice, nor does it raise a presumption of a want of due diligence and care. The burden of proof is never shifted from the plaintiff to show affirmatively that there was a want of skill or diligence, and such testimony must be given by those skilled in the art and practice of medicine.

Certain exceptions may obtain in the application of the foregoing rules. The carelessness and indifference may be so great as to raise a presumption that there was a want of skill and diligence such as no ordinary person would have been guilty of, much less a physician.

A large number of decisions have been rendered in cases where sponges or other foreign substances have been left in the body during an operation. It has been held by some courts that the leaving of such foreign body was *prima facie* evidence of negligence. By other courts the opposite doctrine has been held. To the average person not familiar with the work that a surgeon performs in an operation, it would seem as if such a mischance as the leaving of an instrument or sponge in one of the body cavities would be almost *prima facie* evidence of negligence or a want of skill. To those familiar with the circumstances under which the surgeon operates, the necessity of using a large number of sponges, of which he himself cannot keep track, without jeopardizing his patient, would place it among those mischances that would be judged by the general rule of liability applicable to physicians. In an operating room the rule is that the sponges shall be in charge of a special nurse who shall be responsible for the count. When it is reported to the surgeon that all of the sponges have been accounted for, it would seem as if he were justified in closing the abdomen on the assumption that there was none in the body of the patient. He cannot give personal attention to everything that goes on in the operating room; he must rely on his assistants to provide him with sterile instruments and to see that they are not infected during the course of the operation. He has to rely on an anesthetist, and to pay attention to these things would jeopardize the life of his patient. The very reason that he has assistants is for the purpose of aiding him in the performance of the operation. If he could do all these things for himself it would not be necessary to have assistants or nurses present. In cases such as fractures the result is no evidence against the physician; in cases where foreign substances have passed into the lung during dental treatment the patient could not invoke the doctrine. Cases involving burns from hot-water bottles or *x-rays* have been held no exception to the general rule. Why a sponge case is an exception, thus relieving the plaintiff of the burden of showing by affirmative evidence that the sponge was overlooked because of negligence, is not clearly shown by those cases that adopt the rule. The fact that the surgeon relies upon the count of the sponges when there are other methods, such as tapes and rings, is not controlling, because where there are several recognized methods the surgeon has a right to elect that which he will employ. These methods of accounting for sponges are a question of expert knowledge, as it relates to a specialized undertaking outside of the usual experience



of man; that is, to a surgical operation, hence whether or not the method employed was a recognized one can only be known to those acquainted with such methods and can only be testified to by experts qualified to speak.

**Operating On the Wrong Part.**—To the average layman the loss of a foreign body in a cavity is almost presumptive evidence of negligence. When, however, we examine the circumstances under which an operation is performed, it can clearly be seen that the rule of due care and diligence is all that is applicable. Another and very different question is raised in operating on the wrong part. There are a few instances on record of the removal of a sound eye instead of a diseased one, thus rendering the patient blind. It is hard to see how in a case such as this the physician could avoid being held to full accountability. It has happened that the ear drum of the sound ear has been perforated instead of the diseased ear. A more frequent error is to operate on the wrong side for hernia and occasionally to inject the wrong sciatic nerve for the relief of neuralgia. While many of these operations do not present the gravity of the removal of a sound eye, they ought not to occur, as reasonable prudence on the part of a physician could prevent such an error. It is a well known experience that right and left are very confusing, particularly if the examination has been made in the upright or sitting position and then the patient lies down on his face. It is easy to mark the side that is to be operated upon. We know of no instances in which an amputation of the wrong extremity has been performed, but can readily conceive that such a mischance might occur.

### CRIMINAL MALPRACTICE

**Criminal Liability of the Physician.**—The discussion so far relates only to the civil liability of the physician; that is, the wrong is against an individual and compensation, if any, is assessed as damages. The physician may, however, by conduct so unusual and so devoid of ordinary prudence become a public menace. Under such circumstances he would be liable to a criminal action. As to whether a physician without criminal intent can by conduct so heedless render himself liable to a criminal prosecution has been variously adjudicated. The common law as it came from England held the physician to strict accountability. It was held that gross ignorance and reckless negligence would amount to a presumption of a criminal intent. The early American decisions held to the view that malice must be expressed or implied, and where such was not shown a conviction would not obtain. In some states the common law in criminal matters has no application, hence the rule in such states would be governed by the statutes. The later decisions would suggest that malice or criminal intent may arise out of the well-known principle that one is presumed to contemplate the natural consequences of his acts. If these consequences are so disastrous or so fatal as to justify a presumption of malicious intent the act will be deemed criminal even though it is in fact the result only of negligence or reckless conduct. Such cases, however, are rather of

academic interest, as they are exceedingly rare. The writer knows of but one case: that of a physician who conducted a cancer institute for the cure of this disorder. He applied to the breast of a patient an arsenical paste. There was absorption of arsenic and the patient died of arsenical poisoning. He was indicted for murder, but was never tried. It was evident in this case that it would be difficult to bring it within the rule of expressed or implied malice. His only purpose in treating this woman was to cure her of the cancer. Arsenical pastes had been used by him in hundreds of instances with no such untoward result. Down to comparatively recent times the regular profession of medicine had employed cancer pastes and still employs them in superficial cancers of no great extent.

One of the most picturesque cases was that of *Commonwealth vs. Thompson*, 6 Mass., 134. This was an action brought against the founder, who was the father of the eclectic system of practice. The decision was rendered in 1809. At the time Thompson was practising in Beverly, where he professed to cure black, gray, green, or yellow fever. He had three famous remedies which were called *coffee*, *well-my-gristle*, and a third *ramcats*. In the treatment of this patient not only were these remedies given, but the feet of the patient were placed on a hot stove and he was wrapped in a thick blanket. The remedy given immediately caused vomiting. It was repeated within three minutes, and shortly after that a third dose was given. The patient was caused to vomit violently, after which he was given a draught of the *coffee*. The patient continued to sweat profusely during the night. The following day the patient complained of a good deal of debility, but two more of the emetic powders were given and a quantity of the *coffee*. The patient was then ordered, notwithstanding his weakness, to get up and walk in the air after his face and hands had been washed with rum. In the afternoon two more emetic powders were given and the sweating was repeated. The weakness of the patient increased as the treatment went on. The patient then complained of a great oppression in his chest, and the physician said that the medicine would soon get down and unscrew his navel, it being understood by the bystanders that he meant the medicine would operate as a cathartic. At the end of his illness the patient became unconscious and had convulsions, after which two additional emetic powders were forced down his throat. The convulsions and loss of reason continued at intervals until about a week after the beginning of the treatment, when the patient died. It is noteworthy that the court in this case instructed the jury that to constitute the crime of murder there must be expressed or implied malice. The latter could not be inferred unless the jury was satisfied that the prisoner was wilfully regardless of his duty and determined upon mischief. The court in commenting on this case said: "There is no law which prohibits any man from prescribing for a sick person with his consent if he honestly intends to cure him by his prescription. And it is not felony if, through his ignorance of the quality of the medicine or of the nature of the disease, or both, the patient, contrary to his expectation,

should die. The death of a man killed by voluntarily following a medical prescription cannot be adjudged felony in the party prescribing unless he, however ignorant of medical science in general, had so much knowledge or probable information that it may be reasonably presumed by the jury to be the effect of obstinate wilful rashness at the least, and not of an honest intention and expectation to cure."

*State vs. Schulz*, 55, Ia. 628, raises a very interesting point as to the knowledge that a physician should have of the remedies which he employs. The defendant in this case claimed to be a Baunscheidtist. He used an instrument upon the deceased consisting of fine needles producing excoriations into which he rubbed an oil, the nature of which he did not know, stating that it was a secret of the inventor. In the trial of this case the court instructed the jury that "a party whether he be a physician or specialist has no right to hold himself out to the public as competent to treat diseases and induce the public to employ him unless he knows what the medicine is he uses and its reasonable effect upon the human system, and to do so and to administer internally poisonous medicines in sufficient quantities to ordinarily produce death, and death is produced thereby, he would be guilty of murder. And if the defendant in this case through gross ignorance of the medicine he used or its reasonable effect upon the deceased as she was at the time, caused her death by an overdose of poisonous medicine, he would be guilty as charged." The Supreme Court in reviewing this case held that the instruction was faulty and that the accused could not be held guilty unless he had a knowledge of the fatal tendency of the prescription so that it might reasonably be presumed that he acted with wilful rashness.

In *Commonwealth vs. Pierce*, 138, Mass. 165, the court practically went back to the doctrines announced in the English cases, stating that in criminal matters as in civil there must be an external standard of what would amount to moral recklessness in a man of reasonable prudence. It held that if the prescriptions used were dangerous according to common experience one who made use of them could not escape responsibility upon the ground that he had less than the common experience. "Common experience is necessary to the man of ordinary prudence and a man who assumes to act as the defendant did must have it at his peril. When the jury is asked whether a stick of certain size was a deadly weapon they are not asked further whether the defendant knew it was so. It is enough that he used and saw it such as it was."

**Obtaining Money Under False Pretense.**—Taylor (*The Law in Its Relation to Physicians*) gives an excellent résumé of the case of *Jules vs. State*, 85, Md. 305. The complaining witness testified in this case that he called upon the defendant for medical treatment: "The professor offered me a paper and told me to write my name and age upon it, and not let him see what I wrote. I wrote my name and age upon the paper, and he walked up and down the room and looked out of the window, and took the paper and folded it up, and placed it against his forehead, and then told me what I had written on the paper. He said, 'You



suffer from stomach trouble, and I can and will cure you within six weeks; if not, I will return you your money.' I asked him when I should call again, and he said, 'Don't come; I will come and see you and work on you for hours, and after that you will be well.' He also gave me a charm to wear. I wore it around my neck for one hour. He said to wear it was essential to the treatment. I am not over the stomach trouble yet. He never came to my house and worked on me. I paid him twenty-six dollars and thirty cents."

It is a general doctrine of the law that a criminal action for obtaining money under false pretenses cannot be based upon a promise of future profits or benefits. In this case the accused relied upon the contention, but the court held that an essential part of the transaction was the accused's representation that he was possessed of supernatural power whereby he could cure the witness. This part of the transaction was no promise as to the future, but a positive assertion of a present condition. The mere fact that this was linked with the claim that there would be future benefits would not operate to defeat the prosecution. The prisoner was held to be guilty.

**Criminal Abortion.**—The early law writers did not recognize abortion as a crime, and later it only became a criminal act if it was performed after quickening. This distinction was repudiated in an early Pennsylvania case in which it was held that it was not the murder of the living child which constituted the offense, but the destruction of gestation by wicked means and against nature. While the common law did not regard abortion as a criminal act, yet if the mother died the one who performed the abortion was held to be guilty of murder. This was on the ground that the operation was dangerous to life and had no lawful purpose, hence malice or criminal intent could be inferred. In practically all of the states of the American union criminal abortion is a statutory offense. These statutes are commonly framed to include the administration of drugs or the use of instruments for the purpose of producing a miscarriage, unless it shall be necessary to preserve the life of the mother. In most of the states no liability attaches to the mother for causing herself to miscarry nor in consenting to the act by third parties, she being looked upon rather as a victim than as a party to the criminal act. In some states there are statutes making the mother a party to the criminal action.

It has been held that advising a woman as to the means of producing an abortion would, within the language of most statutes, hold a physician to criminal accountability, providing that the advice was acted upon. In *Lamb vs. State*, 67, Md. 524, it was charged that a physician had advised a woman to take certain drugs for the purpose of causing an abortion, but it was not shown that the woman did take them. In commenting on this case the court said: "It may be urged that a solicitation is an attempt, and that an attempt to commit a misdemeanor is a misdemeanor. Pursuing the same train of inference and reasoning, we may go a step farther and maintain that as the solicitation is a misdemeanor an attempt at solicitation would by the same rule be also a



misdemeanor." In *People vs. Phillips*, 133 N. Y., 267, a physician was prosecuted under the statute which provided that anyone who advised or caused a woman to take any medicine for the purpose of producing an abortion should be deemed guilty of abortion. The court in that case held that it would be an extraordinary construction of the statute in the absence of direct evidence that the woman acted upon the advice to hold that it was an intent.

As to the question of the efficacy of the means employed there is a long line of decisions holding that it is intent that governs. In *State vs. Gedick*, 43, N. J., Law 86, it was held that the design of the statute was to guard the health and life of the female against the consequences of such an attempt, hence if any dangerous operation or noxious drug is recommended, even though the same is not calculated to produce a miscarriage, it will be held as constituting the essence of a criminal offense. It is, therefore, not essential that the miscarriage should take place. It is the administering of the noxious substance or the use of the instruments with intent to produce miscarriage that makes up the crime.

It has even been held that it was not necessary to prove pregnancy in order to render one liable for an attempted abortion. Of course this would only be applicable in states where the statutes fail to state that an attempted abortion must be upon a woman pregnant with child. In such cases it is essential that pregnancy should be proved.

It has been held that the vitality of the fetus is not essential to the commission of the crime. If the physician did not know this fact and attempted to produce the miscarriage for other than a lawful purpose he is criminally liable. It is obvious that in this construction intent is what determines the crime. In most states it is held that induced abortion is justifiable where it is necessary to save the mother's life. Some statutes require that the physician shall avail himself of counsel in order to justify such an operation. If he follows the letter of the statute he will be held harmless. In those states in which there is no special provision it has been held that where the physician believes that the mother's life is in jeopardy the operation is justifiable. If the physician acts upon his own judgment he must judge correctly, but if he acts in good faith and secures consultation he may rely upon the advice of such consultants whether their opinion of the patient's condition is in fact correct or not. Taylor in commenting on this aspect of the physician's duty says: "Should the physician's good faith in obtaining the consultation be questioned, it would then be for the jury to determine from all the attendant circumstances whether the consultation was a mere sham and collusive pretense made to give color of regularity to an unlawful act or was, in fact, an honest effort made to determine the patient's actual condition with a view to rendering to her such medical services as her real needs required." In *Commonwealth vs. Brown*, 121 Mass., 69, an instruction in the following terms was approved: "A physician may lawfully procure the miscarriage of a woman pregnant with child by any means applicable and reasonable for that purpose, if in so

doing he acts in good faith for the preservation of the life or health of such pregnant woman." Such a construction of the law cannot be relied on if the physician fails to exercise the statutory limitations or other precautions such as consultation where the latter could be had. It has been held that the threat of a woman to commit suicide unless her pregnancy was terminated was not justification for terminating the pregnancy. As to whether the defendant physician has to prove that there was a necessity for operating or whether the prosecution must prove that there was no necessity of operating has been variously decided. New York and Wisconsin have affirmatively stated that it was not necessary for the prosecution to show the absence of necessity for operation, but that it was incumbent upon the defense to prove affirmatively its necessity.

As illustrating the danger which attends the professional life of a medical man in relation to this class of cases, Taylor cites the case of *State vs. Clements*, 15 Or., 237. It illustrates the importance of a physician guarding himself against a combination of circumstances that may involve him in a criminal prosecution. The deceased in this case was a young unmarried woman who had been stopping for some time at a hotel where she died. On the morning of her death the defendant locked her door and passed out of the hotel, stating that she was sleeping and he did not want her disturbed. He returned a few hours later to find the patient dying. He was immediately arrested, the officer accompanying him to his office, where he exhibited to the officer a fetus of which he said the deceased had been delivered. Shortly before this and about the time the deceased was first taken sick the defendant exhibited to a druggist a stout sharpened quill about 6 inches long which was bloody, and he stated to the druggist that he wanted him to examine it as he was fearful that he might get into trouble as a woman had been using it for a criminal purpose. The evidence on the part of the defendant was that nineteen days before the deceased died he had been requested to perform an abortion on her, but that he had refused to do it. Ten or twelve days later she called upon him professionally complaining of pelvic symptoms. He found a sponge embedded in the tissues at the mouth of the womb. Removing this, the parts were found to be lacerated, covered with pus, for which he gave local treatment and at the end of six days dismissed the patient. Several days later he saw her and she then denied any attempt to produce an abortion, though the symptoms indicated labor pains. A uterine sedative was given and the doctor continued to treat the patient, after which she informed him that she had inserted a quill into the uterus and she told him where this could be found. A few days later she gave birth to a dead fetus. The physician took charge of the fetus and later surrendered it to the officer. He gave her sedatives and left the hotel, with the statement that she should not be disturbed. Returning about an hour afterward he found her dying, uterine hemorrhage having set in during his absence. The jury returned a verdict of guilty, which judgment was reversed by the Supreme Court.

*Clark vs. People*, 16 Colo., 511, illustrates how easily a combination of circumstances may render a physician liable to prosecution, and, as happened in this case, to a conviction with no very adequate evidence. The prosecution in substance proved that a miscarriage had taken place and that death followed. The defendant was the sole attending physician at the time of the abortion and he burned the fetus instead of burying it. It was also testified to that the landlady of the house, where the deceased was stopping, stated that the defendant had told her the patient was suffering from inflammation of the bowels. The defendant testified that he had been called to see the patient and found her suffering from uterine pains. He advised her against efforts to terminate the pregnancy and warned her of the danger of so doing. He was paid for his attendance and considered himself discharged from the case. A few days later he was again called and found the patient threatened with a miscarriage. Finding that the abortion could not be prevented, he did what he could to relieve the patient. The day before her death, as she was not doing favorably, he desired to have a physician in consultation. To this the patient objected. On the following morning, finding the deceased worse, he telegraphed her father and sent for another physician, but the latter arrived shortly before the patient's death. In reference to burning the fetus, the defendant said that decomposition had already set in and this was the most effective means of disposing of it. The deceased before her death fully exonerated the defendant. Immediately after the death of the deceased defendant took her effects to the coroner and notified that officer of the cause and circumstances of her death.

Taylor, in commenting on this case, says: "How a jury of intelligent men could have rendered a verdict of guilty upon this evidence it is difficult to understand. The forces of eloquence and personal magnetism moved by a mistaken zeal are often potent factors in working injustice and may have been largely accountable for the termination of the present suit. It is extremely gratifying, however, to observe the wholesome check which our higher courts place upon the trial courts which are sometimes betrayed into a display of feeling prejudicial to justice." In reversing the case the Supreme Court said: "The crime charged is one that strikes at the foundation of our social fabric and is well calculated to arouse the indignation of all right thinking people; but to allow this conviction to stand would be to violate the fundamental rule of the criminal law fixing the quantum of proof necessary to sustain a conviction. We fully agree with the attorney-general that prudence would have dictated the calling of counsel at an earlier period in the case; but the neglect in this particular cannot be taken as a justification of the verdict and judgment rendered in the court below."



# IDENTIFICATION OF THE LIVING

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By identification (from the Latin *idem*, the same) one has reference to the systematic determination of the ensemble of the indications which distinguish one person from all others either during life or after death. When this description has to do especially with the apparent characteristics which make it possible to recognize a living person *on sight*, it takes the name of *signalment*. A person (or object) is said to be identified when it is definitely known who he is and, especially, when it has been systematically proved that he is the same as that individual (or object) who is already known and has been previously signalized. The importance which attaches to the determination of identity may be realized by the fact that this is, necessarily, the beginning or the end of a large number of inquiries with which the medico-legal expert may be charged.

Let us remark that, from the purely logical point of view, it is only *non-identity* which is capable of direct demonstration, and this only by the simultaneous presence in two distinct places of two individuals more or less subject to confusion. Therefore, in limiting one's self to this exclusive point of view, identity (or better, the individuality of a person) would be capable of demonstration only by the impossibility of *non-identity*, that is to say, by the impossibility that there may be two individuals to be considered. But, as nothing should be regarded as impossible *a priori*, the reader will realize how and why, from the strictly logical point of view, knowledge of identity, if it is to be best established, will always assume the aspect of a question of probability or of likelihood based upon the manifest impossibility of encountering a second person capable of combining in his personality all the indications and peculiarities which characterize the person under investigation. It is with this in mind that it is necessary to investigate the philosophic origin of the interminable discussions which certain historic or judicial problems have raised and will continue to raise regarding questions of identity, as, for example, the investigation relative to the direct descent of King Louis XVI (Naundorff, etc.) or the cases of Tichborne,<sup>1</sup> Druce Portland, etc. Whatever may be the number and character of the proofs advanced, certain types of mind, more imaginative than positive, will always be able to annul or weaken them (in their eyes at least) by building up hypotheses from conjectures, etc.

<sup>1</sup> See Chapter on Identity, p. 133.



In every-day practice the means by which one determines the identity of a living person varies greatly according to the end sought and the comparative data which one has at his disposal. Thus, when it is necessary to establish identity of a person in cases of succession or in genealogies, etc., this is proved by means which serve to establish the civil status of the individual according to the customs of each country. In the first place, one should produce his birth certificate, which should give, for the sake of completeness, the date and locality of his birth and, further, should show the filiation, that is to say, the surnames and Christian names of the father and the mother; second, in default of the above or concurrently with it, one should present certificates of baptism or of marriage, diplomas, passports, rent receipts, etc. But in establishing a certainty nothing will be of equal value to the actual presence of several upright and disinterested witnesses, who swear under oath that they have known the subject in question for a long time, that they know from whence he came, and, in a word, that they know who he is. The intervention of the scientific expert begins only when one or more of the proofs presented are defective or are found to be suspicious of error or of fraud. Instead of remaining a civil matter, the affair then becomes one for judicial investigation.

The increasing of the correctional punishments which the penal codes of all countries meet out, more or less, to old offenders has given rise in the criminal world to a constantly growing number of cases of concealed identity and often, even, of assumption of the civil status of existing persons. With a view to the systematic uncovering of these subterfuges most civilized countries have established bureaus of judicial identification, to which all criminals, as soon as they are arrested, are conducted, signalized, looked up in the records, and, finally, catalogued for future reference. The end sought by these processes is twofold: First, to find out if the subject arrested is an old offender already catalogued; and, second, to make a descriptive signalment, which may be sufficiently extensive to aid the street police, should the subject in question be sought later for a new crime. The methods adopted vary somewhat in different countries. The physician will find it of advantage to familiarize himself with the general points of the different systems employed, for, although their use may appear to be limited mainly to administrative offices (such, for instance, as the methods of legal anthropometry), they may be found of service in assuring the solution of private medicolegal inquiries, without mentioning the cases in which a medicolegal expert might be appointed by a court in order to control officially the conclusions of the administrative police.

Therefore, in the following sections we will discuss the manner in which these methods should be conducted and interpreted, under the headings:

- I. Pictures and Individual Photographs.
- II. Anthropometric mensuration, applied either to the signalment, properly speaking, of the individual or to the classification of records.

III. Descriptive Characteristics ("Descriptive Picture") and, in general, every type of Verbal Signalment.

IV. Peculiar Marks and Tattooing.

V. Impressions of the extremity of the fingers (dactyloscopy), which, certainly, will be employed in the more or less near future to certify or legalize a large number of civil or commercial operations (such as sight-drafts, life insurance policies, birth certificates, marriage certificates, and, possibly, death certificates).

## PICTURES AND PHOTOGRAPHS

A. How Identification is Made with the Aid of a Photograph.

—The oldest known means of identification is the picture. In our



FIG. 1.—Photographs of the same individual at an interval of two years. Physiognomonic differences resulting from alterations of the beard and hair.

days this has been, almost entirely, supplanted by the photographic

or, if one prefers, the automatic picture. As everything which we will have to say regarding the one applies with equal force to the other, we will limit ourselves to a discussion of the latter.

Recognition of an individual by means of his personal photograph or identification from two photographic pictures appears, at first thought, a most simple process and one for which every technical direction seems unnecessary. To whom, however, has it not happened in the relations



FIG. 2.—Photographs of the same individual at an interval of four years. Physiognomonic differences resulting from a change in the wearing of the beard.

of daily life, for instance, to fail to recognize a person from his photograph or, what is more serious, to identify a person with a photograph which is, in reality, not his own (see Figs. 1–11). To the professional expert, who would escape a laugh at his expense, we would give, therefore, the advice of avoiding an impromptu decision on such occasions. Control of recognition made by means of a photograph is obtained not by a more or less instantaneous impression of the whole, but by an

analytic study of the outlines of the face and, especially, of the ear if possible, in conformity with the limits and the vocabulary of the descriptive signalment, which we shall discuss in detail on pages 88-111. (See Fig. 12, persistence of the form of the ear at an interval of twenty-four years.)

If we suppose that, in the course of this series of successive comparisons, non-identity has not been established by the discovery of one



FIG. 3.—Photographs of the same individual at an interval of five years. Physiognomonic differences resulting from an alteration in the cut of the hair.

of those irreducible morphologic differences which decide the question, as would be the case, for instance, if here there were a concave nose and there a convex nose; in other words, if we suppose that there is no marked discrepancy between the physiognomonic characteristics taken one by one and those reproduced in the picture which one has for comparison, then it would not be necessary to make a conclusion of obligatory identity because one might be face to face with a family



resemblance (especially if there were any question of twin brothers) or confronted with a sequence of similarities due to chance or to an unsuspected cause, as, for instance, the grouping on a similar head of congenital malformations, alcoholic degenerations, or, even, of photographic retouchings, etc. It may happen that the observer, who is not cautioned, may give too much signalitic importance to an ensemble of characteristics, which, unknown to him, will be found to signalize not only a single individual but all of an ethnic or pathologic group. The expert



FIG. 4.—Photographs of the same individual at an interval of eight years. Physiognomonic differences resulting from alterations in the cut of the beard and hair.

must not lose sight of the fact that in this matter (as in many others) the grouping together of similar characteristics will be presented to him more often than direct calculation of the probability would indicate, because he is consulted only when there is, at the time, a question of doubt and a general resemblance. The exceptional cases are sent to him on account of his competency. Therefore he should not be astonished at the resemblance, since the case would not have been referred to him if the resemblance had not existed.

To our knowledge there is no problem in whose solution one may be more easily deceived or may be more prone to fall into error than the identification between two photographs, for the very reason that the solution appears to be so self-evident and because each one believes himself fitted to pass an opinion. There will be found, somewhere, persons particularly well qualified in this respect, but who may be led into error in spite of all the artistic surety of their powers of observation. Therefore, identity, investigated by means of the personal



FIG. 5.—Photographs of the same individual at an interval of nine years. Physiognomonic differences resulting from a change in the cut of the beard.

photograph, may be proved, as we have indicated above, only by the finding in the photograph of some really individual peculiarities, such as cicatrices, maternal nevi, wrinkles, or accentuated asymmetries, anomalies of the pilary system, etc. No doubt exceptions will be taken to the above statement, because in the case of all so-called artistic photographs and, even, in that of many of the pictures taken by amateurs, these anomalies are carefully removed from the proof by means of retouching the original plate.

The first care of the expert, who is consulted in such a case, should be to demand access to the original plate (phototype). If this can be obtained, a thing which happens very often, as the large photographic establishments keep their plates for some time, a wash of benzine will cause the retouchings to disappear and a new printing of two copies, the one light and the other dark, will bring before the eyes even of the less competent the proof or the beginning of proof of identity or of non-identity. If need be, it will be of value to prepare an enlargement,



FIG. 6.—Photographs of the same individual at an interval of fourteen days. Physiognomic differences resulting from alterations in the cut of the beard and hair.

even up to the supposed natural size of the individual. In the absence of the plate, the systematic interpretation of the positive proof will lead one, oftentimes, to the same result. Most of the peculiar marks, such as pigmentary nevi, wrinkles, etc., which artistic photography attempts to remove, being more or less grayish or brown in the living subject, are indicated upon the negative image by outlines, which are not impressed, that is to say, are translucent. Evidences of retouching are, then, looked for by the aid of a strong magnifying lens of 1 to 3 cm.

focus. At this magnification the large number of small contiguous points, skilfully juxtaposed by the retoucher in order to conceal on the negative the nevi and the wrinkles which are outlined in translucent lines on the plate, will appear on the proof as a network, which is thicker in the midst of the fine particles of the surrounding bromid of silver. If this preliminary examination permits any inferences of interesting observations, one should not stop until enlargements of 4 or 5 diameters have been made for comparison (special attention being directed to



FIG. 7.—Fallacious resemblance. Non-identity is shown by the edge of the ear and the outline of the lobe.

clearness of outline), in order to permit of the possibility of placing before competent authority a permanent view of the collection of facts first established with the lens.

In my personal experience this method of investigation has led, on several occasions, to distinctly positive conclusions, which have happily solved some cases of identity, which, at first, seemed incapable of solution. However, it is necessary, when the question arises of comparing two photographs, that the two views should not be too different in rela-



tion to the pose or to the parts seen, for, otherwise, the problem will become insoluble by reason of absence of sufficient data.

**B. How the Signaletic Photographs of the "Rogues Galleries" Should be Taken.**—Identification between signaletic photographs of comparison, which are specially prepared for legal use, is rendered somewhat easier on the condition that one knows how they should be taken.<sup>1</sup>



FIG. 8.—Fallacious resemblance. Non-identity is shown by the dimensions of the ear.

(a) **Pose of the Subject.**—Each subject is photographed in two poses, one showing the right-sided profile, the other a full view of the face, the likenesses appearing on the same plate of 9 x 13 cm. in size. These two views, thus taken with poses as different as possible, are complementary one to the other and permit, in case of need, of exact geo-

<sup>1</sup> This is the first time that the collection of these conditions has been synthesized and presented from the didactic point of view. Up to the present, the methods of taking criminal photographs, which are in use in most of the civilized world, have been presented only in the advertisements, more practical than scientific, of makers of special apparatus for such legal photography.

metric reconstruction of the irregularities and protuberances of the subject, exactly as one would proceed in descriptive geometry, by means of the two classic orthogonal projections (see Fig. 13). Indispensable uniformity of the carriage of the head is assured for each of these pictures by imposing on the subject to be photographed a facial inclination from before backward (or inversely) of such a degree that the line, which, on the profile, unites the external angle of the right eye to the indenture which limits the upper part of the tragus, makes an



FIG. 9.—Fallacious resemblance. Non-identity is shown by the edge of the ear.

angle of 15 degrees with the horizontal. Another condition is that the axis of the objective prolonged horizontally centers between the two eyes (in the photograph of the face) and upon the external angle of the right eye (in the picture of the profile). The placing of the sensitive plate behind the objective is calculated and regulated in consequence. Finally, a sight fixed above the dark chamber carries a glass with a black line inclined at an angle of 15 degrees, which permits, at the same time, of adjusting, if need be, the carriage of the head of the subject and of localizing uniformly the placing of the angle of the right eye upon the

sensitive plate when the dark chamber of the apparatus is raised or lowered. Every lateral displacement of the optical instrument is avoided. A special chair with rotating pivot, upon which the subject is directed to seat himself, assures, by a change in the position of its back, the placing of the image on the lateral plate by bringing, by means of a special mechanical device, the angle of the eye in the two poses into the same plane of reduction.



FIG. 10.—Fallacious resemblance. Non-identity is shown by the profile of the antitragus.

*Direction of the Gaze of the Subject.*—During the pose of the face, the subject is directed to look at the objective and, during the pose of the profile, into a vertical mirror parallel to the optical axis, which reflects his own image, the eyes into the eyes. From a consideration of all of these material dispositions, it results that, in our photographs, the direction of the gaze of the subject is held in the horizontal plane (plane of the horizon of the draftsman), which necessarily passes through the central axis of the objective.

(b) *Illumination.*—The lighting upon the subject should approach,

as nearly as possible, to that known as "open air," inasmuch as this is the light which the police are most often called upon to use in the course of their operations upon the public highway. In the studio, one may obtain this result by placing the back of the optical apparatus turned, as nearly as possible, toward the source of light, whether this be a glass sky-light or artificial light. One need not fear that he may make this light a bit high, in view of the accentuation, to a slight degree, of the physiognomonic characteristics, wrinkles, and depressions of the face.



FIG. 11.—Fallacious resemblance. Non-identity is shown by the inclination of the forehead and of the ear.

The picture of the profile should be taken under the same lighting conditions as that of the face.

(c) **Shade of the Background.**—The first impression, which a view of a picture or photograph makes, depends upon the background, light or dark. At first thought, one might believe that an entirely white background, by outlining the contours by contrast in black, would give pictures more striking and scientifically preferable. Experience has shown that this is far from being the case. All photographs taken upon





FIG. 12.—Persistence of the form of the ear at an interval of twenty-four years. Photographs of the same individual.



FIG. 13.—Poses of the subject. Distance of camera from subject is 2 meters. Distance at which the photographs are to be examined is 40 cm. (Reduction four times.)

a white background give to the uninformed observer the impression of having been made from subjects with tawny complexions, so that

one is ready to exclaim, "these are photographs of negroes" (see Fig. 14). On the contrary, the picture of the same subject taken in front of a pure black background will give some little impression of a bust in



FIG. 14.—Photograph taken upon a white background.

virgin wax or in plaster as far as the fleshy parts are concerned, while the hair and the clothing (when these are of dark shades) will be distinguishable from the background with difficulty. In other words, the



FIG. 15.—Photograph taken upon a black background.

greater part of the silhouette, which is so characteristic of the individual, will disappear (see Fig. 15). It is the intermediate tone (the normal gray), which, being equally removed from the white and black,

will give the best medium for the positive picture. The shade of the background thus arranged will serve, at the same time, as a guide in the development both of the negatives and the positive proofs, the normal gray being the only tone which, in theory at least, has the same value in the positive picture as in the contratype negative. Let us add that the white picture, which results by contrast from the employment of a gray (or black) background, directly impresses the retinal nerves, while the gray picture upon a white background will impress itself only by the absence of luminous sensations. Black is only a blank for the retina, white alone being visible. Thus is explained, we believe, why the luminous picture, traced in white upon a gray or dark background, produces, in the visual memory, an impression more durable and more vivid than the picture with grayish contours, which are partly inhibited by the white of the background.<sup>1</sup>

(d) **Reduction.**—The necessity of being able to place the legal photographs in a small case imposes upon them the form of a visiting card, which is approximately, for each view, 9 to 10 cm. in length and 5 to 6 in breadth. From this fact the obligation arises of giving to our pictures a dimension five times less than the natural size, in order to permit of the inclusion of certain heads measuring 25 cm. including hair and beard.

It is a well-known fact that, in perspective, the reduction is so much the stronger the further the object considered is removed from the person that looks at it. It is not sufficient, therefore, to say that a picture is reduced to a fifth of its natural size. It is necessary to specify the plane upon which the reduction is calculated. In our photographs, the ideal vertical, passing through the external angle of the right eye, plays the rôle of the standard of comparison. The subject to be photographed is supposed to turn on this same right side, when he takes the position for the face, after having posed for the profile (see Fig. 16). All that is in front of the plane drawn through this vertical line parallel to the surface of the picture (front plane) is less reduced than a fifth (that is to say, is larger), while all that is behind is more reduced (that is to say, is smaller).<sup>2</sup>

<sup>1</sup> Let us add that, in order to obtain the normal gray upon the plate, it is necessary that the studio background placed behind the subject should itself be two or three tones deeper, according to its remoteness from the source of light. Below is given the formula which has given us the best results in the preparation of this shade. One need not hesitate to make and use it himself. Powdered white lead, 100 gm.; lampblack, 7 gm.; yellow ochre, 5 gm.; calcined sienna earth, 5 gm.; raw linseed oil, 60 c.c.; spirits of turpentine, 90 c.c.

<sup>2</sup> Thus, there are three principal methods of describing the reduction of a perspective view according as one makes the front plane of comparison pass (1) in front of the subject considered, which is perspective reduction properly speaking; (2) through the central axis or median plane, as would be (for the picture of the profile) the plane of symmetry passing through the vertebral column, which may be qualified as central perspective reduction; and (3) the method intermediate between the two preceding ones, which is the plane of our pictures. This latter method presents the advantage of reducing to a minimum the faults with the nominal reduction mentioned, namely, one-fifth. For the application of these three types of reduction to figures of natural history and, especially, to craniology, see *Anthropologie Métrique* by A. Bertillon and Chervin, Paris, 1909.

(e) **Distance from the Point of Vision (Eye or Objective) to (1) the Picture and (2) to the Subject to be Photographed.**—The distance which should separate the optical apparatus from the subject to be photographed is definitely determined by considerations of physics, of geometric perspective, and of ocular physiology. Starting with this principle that, in order that a photograph may be recognized, it is necessary that it automatically awaken in the eye of the person that looks at it the sensation that it has already been seen, we are led to proceed in such a way that the image, which is formed on the back of the retina when it observes our photograph, may be identical, not only as regards outline but also as to dimension, with that which direct vision of the object had been able to produce previously.

For some time photographic apparatus has been likened to an eye of great dimensions. In this comparison, one represents by a point the



FIG. 16.—Plane of reduction of photographs. Standard of comparison is the vertical line passing through the external angle of the right eye.

lens (or crystalline lens), which causes the inversion of the image. As for the object, we liken it, for the moment, to a plane perpendicular to the principal axis of the lens. Under these conditions, the two images formed, the one on the retina and the other upon the sensitive plate, are necessarily parallel to our plane, the object. It is evident that these two parallel images, having all their points situated upon the prolongations of the same straight luminous emanations from the object, must be geometrically similar (see Fig. 17). If we print a positive proof of our plate, placing gelatin against gelatin, if we carry this picture over to the left a distance equal to the focal distance, and, then, if we submit this to a rotation of 180 degrees around the principal axis of the objective in order to bring it into its normal position, it is evident that, when our crystalline lens looks at the photograph thus placed, it will centralize a silhouette identical as to form and dimension



to that which the object itself sends directly to it (see Fig. 17). Experience teaches that, when one looks fixedly with one eye at a photograph thus placed, it appears to him to stand out in relief, the so-called stereoscopic effect, with this difference, however, that, although the real distance from the picture to the eye is known through the efforts at accommodation, the aerial image molds itself upon the outlines of the reduced picture and appears like the head of a puppet, smaller and

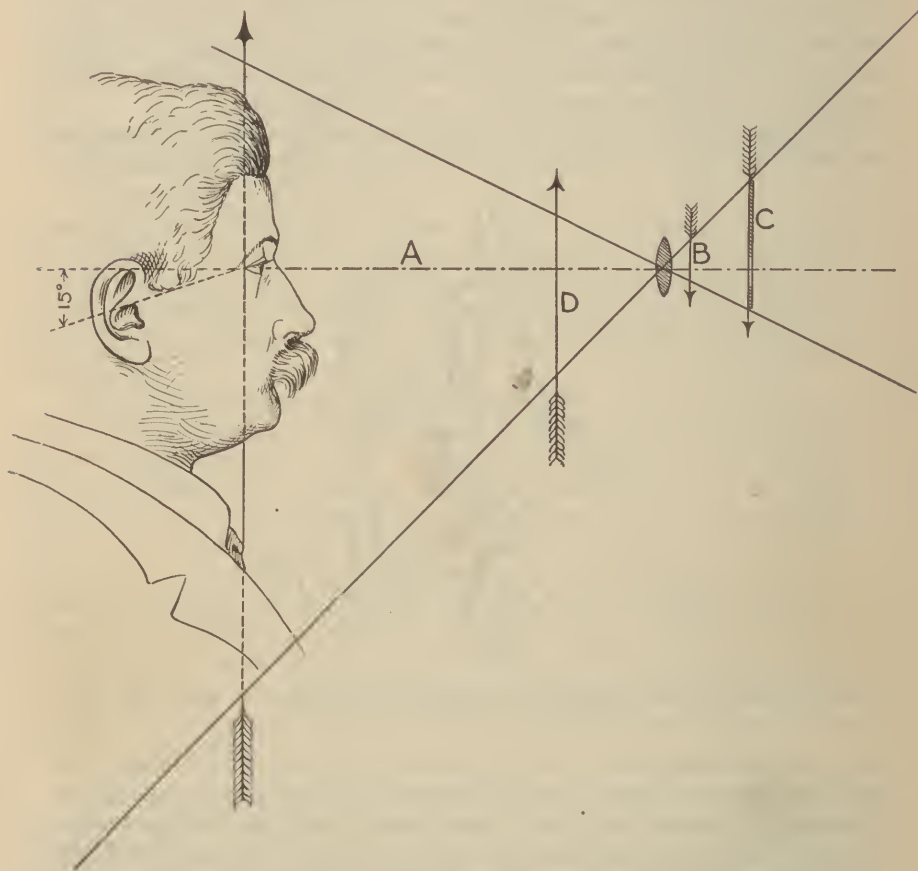


FIG. 17.—A, Principal axis; B, retinal image; C, sensitive plate; D, positive proof.

nearer than the real object. Like the photographic plate, our figure reproduces the classic outline of conical or so-called perspective projection, as Leonardo da Vinci defined it four centuries ago as follows: "A pyramid whose apex is at the crystalline lens and the section (or image) is perpendicular to the visual cone." The Italian master added this condition, that the base of this pyramid must be smaller than one-third of its altitude, in other words, that the eye must be at a distance equal to or greater than three times the greatest dimension of

the object under consideration in order to be in a position to perceive all parts of it simultaneously. If the dimensions of the object or of the image exceed this relation, or if the eye be brought nearer, which amounts to the same thing, the sensitive portion of the retina is not sufficiently wide, so that one does not see the object clearly, but only successively in parts. As our photographic card measures about 13 cm. in its greatest dimension, the observer will be led, in the general run of cases, to place this card at about 40 cm. from his eye in order to obtain a view of the ensemble ( $13 \times 3 = 39$ ). Hence, 40 cm. is the distance which we have adopted for localizing, in the dark chamber of the objective, the apex of the visual pyramid from which our photographs are to be prepared and, then, examined at the end of the investigation. Moreover, let us state that this principal distance of 40 cm. is equally imposed by the necessity of placing our image beyond rather than within the minimal limit of ocular accommodation, which is something more than 30 to 35 cm. These two values, a reduction of 5 and a distance of 40 cm. from the point of observation to the picture (focal distance), oblige us, according to the relations of similar triangles, to impose a distance of 2 meters between the eye (objective) and the vertical line of comparison which passes through the object ( $40 \times 5 = 200$ ). As regards the determination of the absolute focal distance of the objective, which is capable of producing this relationship, this is at once obtained by the well-known optical rule, which consists in dividing the distance of the objective from the plane of the object (2 meters) by the coefficient of reduction plus unity ( $5 + 1$ ), which gives  $200/6 = 33.33$  cm.

These two units, obtained by the above deductions, should serve us well as a starting-point. Our photographs are characterized by this point of view of 2 meters. They are prepared at a distance of 2 meters. Likewise, it is preferable to study the subject at a distance of 2 meters for purposes of identification. Let us remark, in passing, that this distance, which may appear a little long for the identification of a cabinet photograph, exaggerates nothing when it comes to a question of recognition on the public streets. If this distance be more or less than 2 meters, the outlines of the organs, the angles which they form, the one with the other, and the relations of the intervals or depths between the successive planes of the figure are no longer the same.

(f) **Enlargement and Reduction of the Pictures Obtained.**—With the same point of observation as the object, the photographic picture, on the contrary, increases or diminishes in size in direct proportion to its focal distance. Thus, starting with a picture already made, one increases its size to one-half of the natural size (an enlargement of 2.5) by lengthening conjointly the point of observation, from which one looks at it, up to one-half the distance which separates the object from the point 0, that is, 1 meter. Likewise, the projected image of average natural size should be examined at a distance of 2 meters, in order to obtain a view of the whole. Thus, when one groups upon the same page of a small album several columns of photographs of a twofold

reduction ( $1/10$ ), the pictures thus obtained should be examined at a distance of  $40/2$ , that is, at 20 cm., with the aid of convex spectacles if necessary (see below what we have to say concerning the special album for identification of criminals upon the public streets).

(g) **Mechanical Realization.**—Certain types of apparatus have been constructed, which are entirely metallic and which permit the operator, who is stationed behind the sighting mechanism, to place his subject on an elevated platform in a lateral position, in order to take the picture of the profile and, then, to turn the subject by means of levers

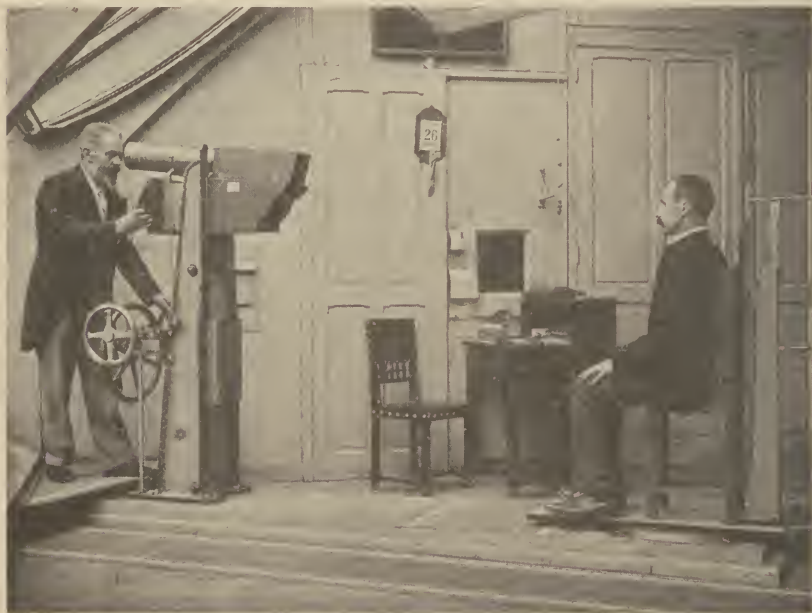


FIG. 18.—Apparatus for taking the photographs employed in this system of identification.

placed within the reach of the operator, into the position for the pose of the face, without the necessity of readjusting the subject himself (see Fig. 18).

### ANTHROPOMETRIC SIGNALMENT

Photography, applied to the recognition of identity, has been able to solve only a part of the problem at hand. Although it may be an easy matter to recognize a person by the aid of his photograph, when both are at hand, how may one find this photograph in a collection of several thousand pictures, which are increasing daily, when the subject under investigation conceals his identity by assuming a false civil status?

Signalment, based upon the measurement of certain well-defined anthropometric elements which are fixed for each individual and variable

according to the individual, furnishes the means of classifying such a collection trichotomously, as one might do with a species of botanical



FIG. 19.—Method of taking the anthropometric measurements: 1, Height. 2, Span. 3, Head and chest. 4, Length of the head. 5, Width of the head. 6, Right ear. 7, Left foot. 8, Left middle finger. 9, Left forearm.

flora. Since 1882 the Prefecture of Police has applied, at my advice, this new signalment to the subjects arrested each day in Paris. The



bases of this system are given here in an order decreasing according to their signalletic value (see Fig. 19).

1. The length of the head, that is, the maximum anterior-posterior diameter, measured, by a caliper graduated in millimeters, from the concavity of the bridge of the nose (fixed point) to the occipital protuberance (maximum point).

2. The classical maximum biparietal cephalic diameter, determined with the same instrument as is the preceding dimension.

3. The length of the middle finger of the left hand, from the extremity of the finger up to the metacarpal articulation (the finger being

Number	417,826	Name.	COLAN
Christian Names.		Aimé, Désiré,	Cognomen.
Born.		January 1, 1876	at Bellevue, cant. dep. Seine
Son of		Joseph, Aimé	and of Adelaide Brun
Identification papers. Birth Certificate.			
Profession, horse dealer.			
Legal antecedents, none			
Reason for detention, rape.			
Imprints of	Established arrests and	Imprint of	
Left Index	other information.	Right Index	
Entered at the			
Station in Paris			
on			
by			

FIG. 19A.—Signalletic card. Front page.

bent at a right angle with relation to the back of the hand), taken by means of the small arm of a sliding gage so constructed that this measurement may be very accurately taken within approximately 1 mm.

4. The length of the left forearm, measured with the large arm of the same sliding gage as above from the point of the ulna to the extremity of the phalanx of the middle finger.

5. The bizygomatic diameter or the maximal horizontal distance separating the two zygomata, measured by means of a pair of calipers.

6. The total height of the body, measured by a movable bevel on

a lateral scale pasted to the wall, against which the subject is stood up with his feet bare and close together.

As fast as these measurements are taken, they are entered upon a form, the front page of which bears the statements of the civil status

Height <u>1.73 m.</u>	Length <u>18.8 cm.</u>	Foot, left <u>25.4 cm.</u>
Vault	Breadth <u>16.2</u>	Middle finger <u>1.7</u>
Span <u>1.79 m.</u>	Bi-zygomatic <u>14.6</u>	Little finger <u>1.8</u>
Head and Chest <u>91</u>	Right Ear <u>6.7</u>	Elbow <u>1.46</u>
Class <u>4</u>	Age	Vault
Aureole <u>2 cm</u>	Born <u>Jan. 1, 1876</u>	Inclination <u>1</u>
Periphery <u>49 m</u>	Apparent age	Height <u>m</u>
Peculiarities	Digital r <u>2.00</u>	Breadth <u>m</u>
	Formula <u>1.4600</u>	Peculiarities
Bridge (profile) <u>m</u>	Edge. <u>0.75 m p m o i</u>	
Ridge <u>2.5</u>	Libbe. <u>c. 2.5 m. 1.5</u>	
Base <u>m</u>	Antitragus. <u>1.5 p. 1.5</u>	
Length <u>m</u>	Fold. <u>1.5 1.5 1.5</u>	
Thickness <u>m</u>	Peculiarities.	
Breadth <u>m</u>	<u>enlargement</u>	
Peculiarities <u>End of r</u>		
Race	Hair <u>ch m</u>	Beard <u>2 m</u>
Color	Shoulders <u>i</u>	L
Pigmentation <u>m</u>	The Waist	
Sanguinolence <u>2</u>	Characteristic Traits.	
Peculiar Marks & Cicatrices.		
Notes	III. cic 2 de 1.5 de ml are 7.5 de 2.5 de 1.5	
I. cic 2 de 1.5 de 1.5 f p	E all d	
	IV. brown spot on da	
	1.5/0.5 2.5 2.5 2.5	
	V. cic 2 de 1.5 de 1.5	
II. no ch r	2.5 2.5 2.5 2.5	
no a c ch r	VI.	
cic 2 de 1.5 de 1.5 f m d		
Taken on	By	
Pouce dr.	Index dr.	Medius dr.
Annulaire dr.	Auriculaire dr.	

FIG. 19B.—Signaletic card. Back page.

as furnished by the detained subject, while the back of this form shows his photograph (in two views, one of the face and the other of the profile of the right side in conformity with the outline discussed elsewhere), the color of the left iris and a minute description of the peculiar marks which are presented by the individual examined, with a rigor-

ous indication of their form, dimensions, and situation (see page 115). Finally the prints of the 10 fingers are placed in the spaces reserved for them (see Figs. 19A and 19B).

Herewith is given the distribution which will be afforded by a collection of 90,000 photographs or signaletic forms, classified by the aid of the six measurements given above. These 90,000 signalments of adults of the same sex are first divided, according to the length of the head, into three groups as follows: small, 30,000 cards; medium, 30,000 cards; large, 30,000 cards. The words, small, medium, and large, are carefully determined by the figures obtained. In order that these groups may be approximately equal, it is evidently necessary that the series of medium lengths should be within smaller limits than those of the groups of small and large lengths. In Paris the medium length varies between 183 and 190 mm. Each of these three large groups of 30,000 signalments is then divided into three new groups according to the breadth (biparietal diameter) of the head. This gives a quotient of 10,000 as follows: small, 10,000 cards; medium, 10,000 cards; large, 10,000 cards. It is a matter of general knowledge that the transverse diameter of the head is not in direct relation to the anteroposterior diameter. Upon just this peculiarity is founded the distinction established by anthropologists between the brachiocephalics and the dolichocephalics. The length of the middle finger furnishes a third indication, which divides still further each of the nine preceding groups into three others, making a total of 27 groups of about 3300 signalments each. The length of forearm reduces, in its turn, the groupings to 1100 in each of 81 new groups. Then, by the intervention of the bizygomatic diameter measurement, each of these groups is divided into packs of less than 400 cards each, with a total of 243 divisions. Finally, the height of the body will subdivide still further each of these latter groups into 3 fractions of about 125 signalments each, making in all a total of 729 subdivisions obtained by means of these six new anthropometric coefficients alone. Should this reduction appear to be insufficient, one may utilize the principal divisions resulting from the disposition of the papillary impressions of the fingers, or, even further, may have recourse to the elimination furnished by the "Descriptive Photograph," which is discussed on page 88. Thus, one finally obtains groups which contain at most about 10 cards, among which it becomes an easy matter to discover the signalment of the old offender with whom one may be occupied.

In order to proceed with this investigation, it is only necessary to direct one's attention to the group showing a length of head corresponding to that of the subject, whose signalment is at hand, and to select in this division the subdivision which corresponds with his breadth of head. Then, seek the subdivision of the middle finger, that of the forearm, that of the bizygomatic diameter, and, finally, that of the height. Through this elimination following elimination, one comes to a small pack of cards which will contain the signalment and the photograph sought, if, let it be understood, one is dealing with an individual



who has been previously subjected to these measurements. It will then be an easy matter to determine his legal antecedents.

When one or more of these measurements fall above the limits of the divisions of the classification, the investigation should be followed through the different groups. These limited studies may bear upon several measurements at the time, in which case it becomes necessary to direct them in a definite order by following the mechanical law of combinations, to which those that employ it have given the characteristic name of "duplicate investigation." It is in such cases that one encounters the only difficulty in making an identification with anthropometric methods, but this is easily surmountable.

Anthropometric signalment, completed by the apposition of the imprints of the ten fingers of the two hands of the subject, is actually the only method in use in the civil and military prisons of France and its colonies, by reason of various official ministerial circulars and orders of the Prefect of Police. It is, likewise, employed for solving the question of identity of cadavers at the morgue in Paris, where a good number of unfortunates, of whom the majority have had trouble with the authorities, find an end.

In his inaugural thesis at Paris in 1892, my brother, Dr. George Bertillon, relied upon the laws of signalment in order to establish the method of utilizing anthropometric measurements in judging the size of articles of clothing (such as coiffures, jackets, trousers, gloves, footwear, etc.) and, inversely, of reconstructing, by the aid of pieces of clothing, the anthropometric measurements of the person who has worn them. This proceeding is very often of service in criminal affairs where the police has discovered *in loco* one or more of these affects abandoned by the author of the crime and by the aid of which has been able to reconstruct his body lengths with sufficient approximation to permit of the finding, in the anthropometric collection, of the signaletic card, which the criminal had previously left in the hands of the legal authorities.

One may say that, in general, anthropometric signalment comes to the aid of descriptive signalment (see page 88) by facilitating the recognition of the individual sought, who is circulating at liberty on the public streets. Anthropometry is applicable from the age of eighteen years, with the use of tables of correction; but, from the age of twenty years, the help of these tables is no longer indispensable, as the variations cease to be appreciable. Only a small and inexpensive installation is necessary for the proper utilization of this method. The indispensable material consists of only two instruments (a pair of calipers for measuring the cephalic diameters and a sliding gage for the length of the middle finger and the forearm) and a meter scale rigidly fixed to the wall for measuring the height of the body.

While the results obtained since the introduction of this anthropometric system into the penal regulations have considerably facilitated the work of justice by unveiling the past of more than 20,000 old offenders who have sought to hide it, it is well to make it clear, with-



out insisting further, that these 20,000 identifications have given rise to no sort of error in identity. We will go even further in saying that there never has been any hesitation in arriving at the identity. This is a generally recognized fact and one which we affirm without any fear of contradiction.

### DESCRIPTIVE SIGNALMENT

Descriptive signalment arises directly from the anthropometric seriation. The difficulties, which the employment of photographic pictures presents as regards the investigation and recognition of criminals, are due to the fugitive nature of the picture in the memory and the



Nose with concave ridge.



Nose with rectilinear ridge.



Nose with convex ridge.

FIG. 20.



Nose with ascending base.



Nose with horizontal base.



Nose with descending base.

FIG. 21.

modifications which are produced in the general aspect of the physiognomy of the person under investigation. These obstacles may be combatted, as we have said, by the analytic study of the individual characteristics by means of an appropriate descriptive vocabulary, from which arises the expression "descriptive photograph" or, in other words, "verbal picture" (established by means of words), as it is designated administratively. In the following discussion we will outline briefly the general principles of the method.

The rational description of an organ depends upon the separation into two points of view very distinct from one another: (1) relative to the form; and (2) relative to the dimensions. Thus, as regards the

nose, one describes, in the first place, the form of the profile (analyzing it according to the form of the line of the ridge and the inclination of the base, see Figs. 20, 21); then, one would note the dimensions, speaking separately of the length, the prominence, and the breadth. The two forms (line of the ridge and inclination of the base) as, also, the three dimensions (length, breadth, and thickness) are each the object of a special rubric, the ensemble of which constitutes the descriptive formula of the nose as reproduced upon our list (see table on page 96).

One recognizes that an analytic description has been pushed to its ultimate limit when it responds to rubrics of dimensions or of intensity with one of the qualifying series, small, medium, and large; to questions relative to shades by those of clear, medium, and dark; and

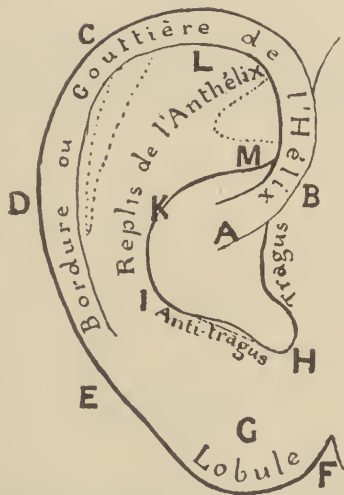


FIG. 22.—Edge of ear, A, B, C, D, E, divided into beginning portion, A-B; upper part, B-C; posterior part, C-D; and lower part, D-E. Take E-F, G-H, considered under the relations of the contour E-F; of the adherence to the cheek, E-F-H; of the conformity of the surface, G; and of its length. Antitragus, H-I, examined from the point of view of its inclination, its profile, its degree of eversion, and its volume. Internal folds separated into a lower branch, I-K; a superior, K-L, and a median, K-M.

to rubrics of form by an appropriate vocabulary and one especially graded to permit the notation and classification of intermediary or average terms, which are much the more numerous and more difficult to appreciate. Thus, we have just seen that the words concave, rectilinear, and convex will be employed for lines like those of the ridge of the nose; ascending, horizontal, or descending for directions such as those of the base of the nose, corners of the mouth, etc.

In describing the ear we will distinguish, successively, the following parts in passing from without within: the edge or groove of the helix; the lobe; the antitragus; and the fold of the antihelix (see Fig. 22). The edge will be qualified as small, medium, or large, according to its width. The lobe will be considered under the four relations: (1) of the contour, which will be sloping, square, intermediary, or round (see

Fig. 23); (2) of the degrees of adherence to the cheek, which will be adherent, partially separated (which is expressed by the word, inter-



Lobe with square contour.



Lobe with intermediate contour.



Lobe with round contour.

FIG. 23.

mediate), and, finally, separated (see Fig. 24); (3) of the conformity of the surface, which may be crossed (by the prolongation of the helix),



Adherent lobe.



Intermediate lobe.



Separated lobe.

FIG. 24.

or may be flat (see Fig. 25); and (4) of its length, which may be small, medium, or large. The antitragus is considered under three heads: (1) it presents a general line of direction of which the inclination may vary



Lobe with crossed surface.



Intermediate lobe.



Level lobe.

FIG. 25.

(see Fig. 26) from the horizontal to an obliquity which, in certain extreme cases, may attain an angle of 45 degrees, those cases which cannot be spoken of as horizontal and which, nevertheless, are not frankly

oblique being spoken of as intermediate inclinations; (2) the antitragus may present a profile either rectilinear, or slightly curved (called inter-



Antitragus with horizontal inclination.



Antitragus with intermediate inclination.



Antitragus with oblique inclination.

FIG. 26.

mediate), or frankly protruding (see Fig. 27); and (3) the antitragus, especially its free extremity, may be regarded from the viewpoint of the degree of eversion, from which the three qualifying terms, everted,



Antitragus with rectilinear profile.



Antitragus with intermediate profile.



Antitragus with protruding profile.

FIG. 27.

intermediate, and straight, have arisen (see Fig. 28). Finally, the fold of the antihelix separates ears with convex cups from those with concave or deep cups. Moreover, all the anomalies of the ear have received



Everted antitragus.



Intermediate antitragus.



Straight antitragus.

FIG. 28.

special names, of which one will find a list in the large table of descriptive terms given below.

Likewise, for the eyebrows: One will consider successively the situation, that is, whether they are close together or separated, low or



high; the form, whether arched, rectilinear, or sinuous; the dimensions, whether short or long, narrow (linear) or broad; finally, the peculiarities of implantation, that is, whether they are sparse or dense, pig-tail-like or brush-like, etc. However, these rubrics are only reminders to aid the observer, who should, in most cases, be satisfied with only one or two of them, if they are found to be appropriate.<sup>1</sup>

# RECAPITULATIVE TABLE OF DESCRIPTIVE INFORMATION USED ON THE SIGNALNETIC CARD CALLED "VERBAL PICTURE" (METHOD OF BERTILLON)

## I. CHROMATIC CHARACTERISTICS AND ASSOCIATED SIGNALNETIC TERMS

### A. Color of the Left Iris.

- |                            |  |
|----------------------------|--|
| (a) Shades of the Aureole. | (b) Shades of the Periphery.   |
| 1. Pale.                   | Sky-blue, intermediate-violet, slate-colored (with or without paleness).                     |
| 2. Yellow.                 | Sky-blue, intermediate-violet, slate-colored; pale, yellowish, greenish.                     |
| 3. Orange.                 | Sky-blue, intermediate-violet, slate-colored; yellowish, greenish (with or without pigment). |
| 4. Auburn.                 | Intermediate-violet, slate-colored; yellowish, greenish (with or without pigment).           |
| 5. Chestnut.               | Slate-colored, yellowish (without chestnut pigment).   |
| 6. Chestnut.               | Chestnut streaked with greenish.   |
| 7. Chestnut.               | Pure chestnut.   |

### (c) Complementary Information.

- Form of the aureole: irregular, concentric, radiating.
- Tones of the shades of the aureole and periphery: clear, medium, and dark.
- Peculiarities of one or other eye.  
Speckled; yellow, orange, auburn, or chestnut sector; wall-eyes (indicate color of the right iris); albino eyes; grayish concentric zone; arcus senilis; speck on the eye; pupil dilated, pear shaped, or excentric; blind or removed eye (left or right); glass eye.

### B. The Hair.

- Shade.  
Blond, auburn, dark auburn, black; red, light red, dark red; grayish; white.
- Tone.  
Clear, medium, or dark.
- Nature or degree of waving.  
Straight, wavy, eurled, frizzed, kinky, or woolly.
- Outline of frontal insertion.  
Circular, rectangular, or pointed (receding).



FIG. 29.—Outline of frontal insertion of the hair: 1, Circular; 2, rectangular; 3, pointed.

- Abundance.  
Scattered; very abundant.
- Baldness.  
Frontal, occipital, parietal, or complete.

<sup>1</sup> The terms chosen to represent the diverse rubrics of the formulæ have been grouped in a "Recapitulative Table of Descriptive Information," and is reproduced herewith.



FIG. 30.—Baldness: 1, Frontal; 2, occipital; 3, frontoparietal.

7. Cut.

Its designation according to the custom of the day.

8. Peculiarities.

Locks of different shade; albino; dying; wigs; affected with tinea; spots of alopecia, etc.

C. *The Beard.*

1. Shade.

Blond, chestnut, dark chestnut, black; red, light red, dark red; grayish; white.

2. Tone.

Clear, medium, or dark.

3. Nature of the hair.

Stiff or pliable; straight, wavy, curled, or frizzed.

4. Site and abundance.

Mustache, side-whiskers (goat-like, ring shaped, or complete); smooth face.

Scattered or abundant, completed, if it seems important, by the designation of the smooth parts.

5. The cut.

Horseshoe-like, imperial, ring-like, chin whiskers (French style), chin whiskers (American style), shaved chin, different side whiskers with or without mustache, etc.

6. Peculiarities.

Mixed with ——— and ———; albino; dyed.

D. *Race.*

Type of ethnic character (in case of foreigners only).

Negro, mulatto, Chinese, Arab, gipsy, half-breed, etc.

E. *Complexion.*

1. Pigmentation.

Little, medium, much.

2. Sanguinolence.

Little, medium, much.

3. Peculiarities.

Tanned, jaundiced, yellowish, waxy, chlorotic; freckles, eruptions, acne, pigmented spots, etc.

## II. MORPHOLOGIC CHARACTERISTICS

### 1. WITH SPECIAL REFERENCE TO THE PROFILE



FIG. 31.—Points of the profile: A, Insertion of the hair; B, palpebral arch; A-B, inclination of the forehead; A-L, height of forehead; C, bridge of nose; D, end of nose; C-D, ridge of nose; E-D, inclination of the nose; A-D, frontonasal profile; E-F, nasobuccal profile; G-H, oculotragian line; G-I, horizontal line; G-O, cranial height.

A. *The Forehead.*

1. Prominence of the vault.  
Small, medium, large.



FIG. 32.—Prominence of the vault of the forehead: 1, Very small; 2, small; 3, slightly small; 4, medium; 5, slightly large; 6, large; 7, very large.

2. Inclination.

Oblique (sloping backward); intermediate; vertical, prominent (bulged out).

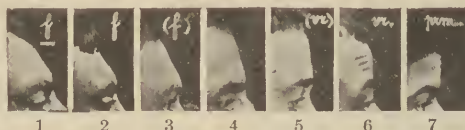


FIG. 33.—Inclination of the forehead: 1, Very oblique; 2, sloping; 3, slightly sloping; 4, intermediate; 5, slightly vertical; 6, vertical; 7, prominent.

3. Height.

Small, medium, large.



FIG. 34.—Height of forehead: 1, Very small; 2, small; 3, slightly small; 4, medium; 5, slightly large; 6, large; 7, very large.

4. Breadth.

Small, medium, large.



FIG. 35.—Breadth of forehead: 1, Very small; 2, small; 3, slightly small; 4, medium; 5, slightly large; 6, large; 7, very large.

5. Peculiarities.

Prominence of the sinus or of the frontal protuberances; arched profile.



FIG. 36.—Peculiarities of the forehead: 1, Prominence of the sinus; 2, prominence of the frontal protuberances; 3, arched profile.

B. *The Lips.*

1. Nasolabial length.  
Small or large.



FIG. 37.—Nasolabial length: 1, Small; 2, large.

2. Prominence.  
Superior prominent or inferior prominent.



FIG. 38.—Prominence of lips: 1, Upper; 2, lower.

3. Edges.  
Small (slightly bordered) or large (extensively bordered).



FIG. 39.—Edges of lips: 1, Small; 2, large.

4. Thickness.  
Small (thin) or large (thick).



FIG. 40.—Thickness of lips: 1, Thin; 2, thick.

5. Peculiarities.  
Defects in adherence (upper lip curving upward, lower lip drooping), median furrow accentuated; cracked lips; cicatrix of hare-lip.



FIG. 41.—Peculiarities of the lips: 1, Upper lip turned up; 2, lower lip turned down; 3, median, ridge accentuated; 4, cracked lips; 5, cicatrix of harelip.



C. *The Nose.*

## 1. Depth of the Bridge.

Small, medium, or large.



FIG. 42.—Depth of bridge of nose: 1, Very small; 2, small; 3, slightly small; 4, medium; 5, slightly large; 6, large; 7, very large.

## 2. The Ridge.

Cave, rectilinear, vex, arched, sinuous.



FIG. 43.—Ridge of the nose: 1, Very cave; 2, cave; 3, slightly cave; 4, rectilinear; 5, slightly vex; 6, vex; 7, very vex.



FIG. 44.—Ridge of the nose: 1, Cave sinuous; 2, rectilinear sinuous; 3, vex sinuous; 4, arched sinuous; 5, slightly arched; 6, arched; 7, very arched.

## 3. The Base.

Turned up, horizontal, or turned down.



FIG. 45.—Base of the nose: 1, Very much raised up; 2, raised up; 3, slightly raised; 4, horizontal; 5, slightly lowered; 6, lowered; 7, much lowered.

## 4. Length.

Short, medium, or long.



FIG. 46.—Length of the nose: 1, Very short; 2, short; 3, slightly short; 4, medium; 5, slightly long; 6, long; 7, very long.

## 5. Prominence (thickness).

Small, medium, or large.

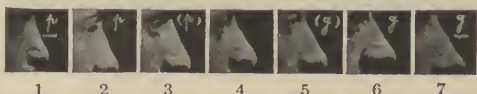


FIG. 47.—Prominence (thickness) of the nose: 1, Very small; 2, small; 3, slightly small; 4, medium; 5, slightly large; 6, large; 7, very large.

## 6. Breadth.

Small, medium, or large.

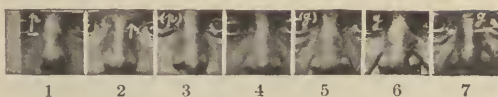


FIG. 48.—Breadth of the nose: 1, Very small; 2, small; 3, slightly small; 4, medium; 5, slightly broad; 6, broad; 7, very broad.

## 7. Peculiarities.

Bridge of the nose very narrow or very broad; length very small or very great; dorsal line in shape of an S; ridge of nose flat, narrow or broad, broken, curved to the left or right; tip of nose tapering or large, bilobed, flat, turned to the left or right, blotched; septum visible or invisible, absent, deviated to left or right; nostrils fixed or mobile, dilated or pinched, left or right nostril flattened or raised, recurrent.



FIG. 49.—Peculiarities of the bridge of the nose: 1, Very narrow; 2, very broad; 3, short; 4, long.

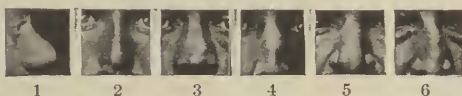


FIG. 50.—Peculiarities of the ridge of the nose: 1, In shape of S; 2, sharp; 3, broken; 4, flat; 5, broad; 6, curved to the left.



FIG. 51.—Peculiarities of end of the nose: 1, Tapering; 2, bilobed; 3, deviated to the left; 4, large; 5, flat; 6, deviating to right.



FIG. 52.—Peculiarities of the septum of the nose: 1, Visible; 2, invisible.

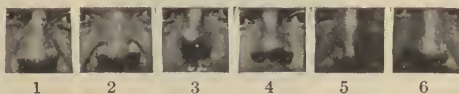


FIG. 53.—Peculiarities of the nostrils: 1, Fixed; 2, dilated; 3, left flattened; 4, recurrent; 5, pinched; 6, raised.

## D. The Mouth.

## 1. Dimensions.

Small or large.



FIG. 54.—Dimensions of the mouth: 1, Small; 2, large.

## 2. Peculiarities.

Tightly closed or open; corners raised or lowered; lowering of the left or right corner; oblique to the left or right; Cupid's bow; thick lipped. Dentition: upper or lower incisors exposed, large, out of alinement, or projecting; loss of upper incisors; false teeth, etc.

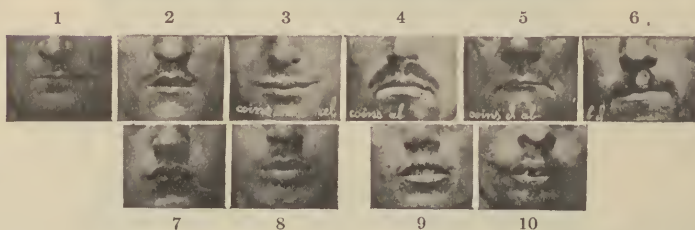


FIG. 55.—Peculiarities of the mouth: 1, Tightly closed; 2, open; 3, corners raised; 4, corners lowered; 5, right corner lowered; 6, oblique to the right; 7, Cupid's bow; 8, thick lipped; 9, upper incisors exposed; 10, incisors projecting.

E. *The Chin.*

## 1. Inclination.

Receding or projecting.



FIG. 56.—Inclination of the chin: 1, Receding; 2, projecting.

## 2. Length.

Short or long.



FIG. 57.—Length of the chin: 1, Short; 2, long.

## 3. Breadth.

Small (pointed); large (square).

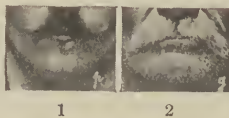


FIG. 58.—Breadth of the chin: 1, Small (pointed); 2, large (square).

## 4. Peculiarities.

Outlines: Flat or tufted, dimpled, bilobed. Accentuation of the ridge under the chin.



FIG. 59.—Peculiarities of the chin: 1, Flat; 2, crested; 3, dimpled; 4, elongated dimple; 5, bilobed; 6, submental ridge accentuated.

F. *General Contour of the Head.*

## 1. Frontonasal profile.

Continuous or broken; parallel or angular, arched, wavy.



FIG. 60.—Frontonasal profile: 1, Continuous; 2, broken; 3, parallel; 4, angular; 5, arched; 6, wavy.

## 2. Nasobuccal profile.

Prominence of the bone at base of nose; dental prominence. Prognathism, superior, inferior, and total. Orthognathism, superior and total. Re-entrant face.



FIG. 61.—Nasobuccal profile: 1, Prominence of bone at base of nose; 2, superior prognathism; 3, inferior prognathism; 4, total prognathism; 5, dental prominence; 6, superior orthognathism; 7, total orthognathism; 8, re-entrant.

## 3. Syntheticism.

Semilunar, gable-like, etc.



FIG. 62.—Profile syntheticism: 1, Semilunar; 2, gable-like.

## 4. Cranial height.

Skull low or high.



FIG. 63.—Cranial height: 1, Low; 2, high.



## 5. Malformations and cranial peculiarities.

Occiput flat or prominent; cranium completely covered with hair, keel-shaped, or sack-like; brachycephalic or dolichocephalic extremes.



FIG. 64.—Cranial peculiarities: 1, Flat occiput; 2, prominent occiput; 3, cranium covered with a "bonnet" of hair; 4, keel-shaped cranium.

G. *The Right Ear.*

FIG. 65.—The right ear: A-B, Beginning (original) portion of the edge; B-C, anterior edge; C-D, upper edge; D-E, posterior edge; G, lobe; F, point of attachment of lobe to the cheek; H-B, tragus; H-I, antitragus; I-K, lower fold; K-L, upper fold; O, conch; U-U, navicular fossa; R, digital fossa; S, intertragian canal.

1. *The Edge.*

(a) Length of the beginning portion.

None, small, medium, or large.



FIG. 66.—Length of beginning (original) portion of edge of ear: 1, None; 2, small; 3, slightly small; 4, medium; 5, slightly large; 6, long; 7, very long.

(b) Breadth of the upper portion.

Flat, narrow, medium, or broad.



FIG. 67.—Breadth of upper portion of edge of right ear: 1, Flat; 2, small; 3, slightly small; 4, medium; 5, slightly broad; 6, broad; 7, very broad.

(c) Breadth of the posterior portion.

Flat, narrow, medium, or broad.



FIG. 68.—Breadth of posterior portion of edge of right ear: 1, Flat; 2, narrow; 3, slightly narrow; 4, medium; 5, slightly broad; 6, broad; 7, very broad.

- (d) Degree of opening of the posterior portion.  
Open, intermediate, adherent.



FIG. 69.—Degree of opening of the edge of the right ear: 1, 2, Open; 3, 4, 5, intermediate; 6, 7, adherent.

- (e) Peculiarities.

Nodosities, widenings, projections, and Darwinian tubercles.  
Border crumpled, indented; posterior edge diminished (on a level with the inferior point of the navicular fossa).  
Upper contour acute, supero-anterior contour square or acute; supero-posterior contour square or acute; superior contour doubly curved or obtuse-acute.

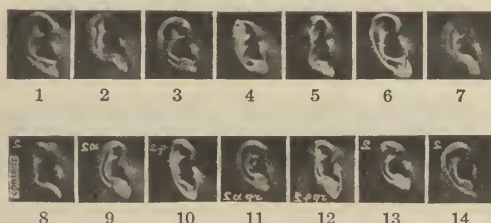


FIG. 70.—Peculiarities of edge of right ear: 1, Nodosity; 2, widening; 3, protuberance; 4, tubercle; 5, crumpled; 6, indented; 7, posterior edge diminished; 8, upper edge acute; 9, upper anterior edge acute; 10, upper posterior edge acute; 11, superior anterior edge square; 12, superior posterior edge square; 13, upper edge doubly curved; 14, upper edge obtuse-acute.

## 2. The Lobe.

- (a) The contour.

Sloping, square, intermediate, round.

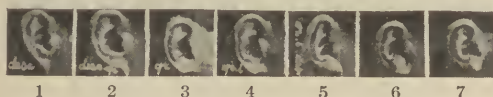


FIG. 71.—Contour of the lobe of the ear: 1, Descending; 2, sloping—square; 3, square; 4, square—intermediate; 5, square—intermediate, sloping; 6, intermediate; 7, round.

- (b) Adherence to the cheek.

Fused, intermediate, separated.



FIG. 72.—Adherence of lobe to the cheek: 1, 2, Fused; 3, slightly adherent; 4, intermediate; 5, slightly separated; 6, 7, separated.

- (c) Conformity of the surface.

Crossed, intermediate, level, or prominent.

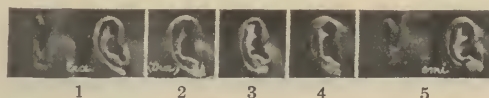


FIG. 73.—Conformity of the surface of the lobe: 1, Crossed; 2, slightly crossed; 3, intermediate; 4, level; 5, prominent.

## (d) The length.

Short, medium, or long.



FIG. 74.—Length of the lobe of the ear: 1, Very small; 2, small; 3, slightly small; 4, medium; 5, slightly long; 6, long; 7, very long.

## (e) Peculiarities.

Lobe pierced, split (once, twice, or three times); lobe narrow or broad. Lobe with an inclination oblique internal or external; lobe with an anterior twisting; lobe with dimple, hook, or island; single oblique posterior wrinkle and multiple wrinkles.

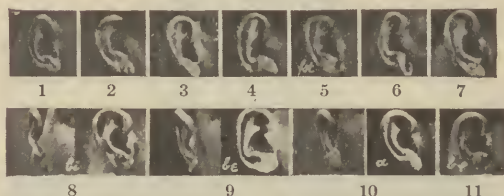


FIG. 75.—Peculiarities of the lobe of the ear: 1, Pierced; 2, split; 3, narrow; 4, broad; 5, dimpled; 6, hooked; 7, lobe with island; 8, inclination oblique internal; 9, inclination oblique external; 10, twisted anteriorly; 11, oblique posterior wrinkle.

## 3. The antitragus.

## (a) Inclination.

Horizontal, intermediate, or oblique.



FIG. 76.—Inclination of the antitragus: 1, 2, Horizontal; 3, slightly horizontal; 4, intermediate; 5, slightly oblique; 6, oblique; 7, very oblique.

## (b) Profile.

Cave, rectilinear, intermediate, protruding.

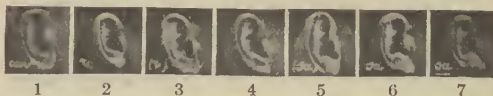


FIG. 77.—Profile of the antitragus: 1, Cave; 2, rectilinear; 3, slightly rectilinear; 4, intermediate; 5, slightly protruding; 6, protruding; 7, very protruding.

## (c) Eversion.

Everted, intermediate, or straight.



FIG. 78.—Eversion of the antitragus: 1, Everted; 2, 3, intermediate; 4, straight.

## (d) Volume.

None, small, medium, large.



FIG. 79.—Volume of the antitragus: 1, None; 2, slight; 3, slightly small; 4, medium; 5, slightly large; 6, large; 7, very large.

## (e) Peculiarities.

Antitragus united with the beginning portion of the edge; tragus very pointed, bifurcated; tragus and antitragus hairy; postantitragian indenture, intertragian canal very narrow; navicular point in form of a dimple.

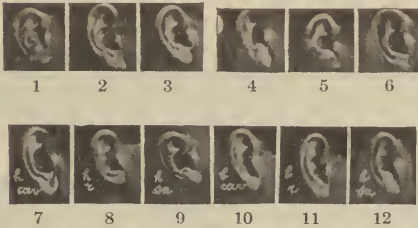


FIG. 80.—Peculiarities of the antitragus: 1, United with border; 2, tragus pointed; 3, tragus bifurcated; 4, postantitragian indenture; 5, narrow intertragian canal; 6, navicular point dimpled; 7, horizontal antitragus with cave profile; 8, horizontal antitragus with rectilinear profile; 9, horizontal antitragus with protruding profile; 10, oblique antitragus with cave profile; 11, oblique antitragus with rectilinear profile; 12, oblique antitragus with protruding profile.

## 4. Hollows and general form.

## (a) Inferior or horizontal cup.

Cave, intermediate, or vex.

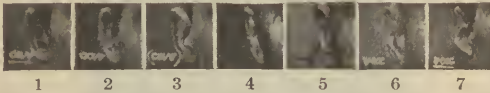


FIG. 81.—Lower or horizontal cup of ear: 1, Very cave; 2, cave; 3, slightly cave; 4, intermediate; 5, slightly vex; 6, vex; 7, very vex.

## (b) Superior cup.

None, obliterated, intermediate, accentuated.



FIG. 82.—Upper cup of ear: 1, None; 2, obliterated; 3, slightly obliterated; 4, intermediate; 5, slightly accentuated; 6, accentuated; 7, very much accentuated.

## (c) General form of ear.

Triangular, rectangular, oval, or round.



FIG. 83.—General form of the ear: 1, 2, Triangular; 3, 4, rectangular; 5, oval; 6, 7, round.



## (d) Separation of ear.

Superior, posterior, inferior, total (pedunculated).



FIG. 84.—Separation of ear: 1, Superior; 2, posterior; 3, inferior; 4, total (pedunculated); 5, upper border close to head, lower border divergent at the antitragus.

## (e) Peculiarities.

Upper hollow with several branches joining the edge; hematoma of the upper hollow; horizontal median hollow; conch low or high, narrow or broad, pushed back, crossed, etc.; ear narrow or broad; sources contiguous or widely separated; ear adherent above and divergent below; ear with vertical or very oblique insertion.

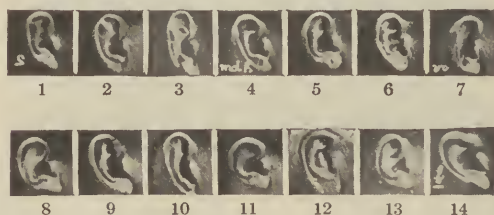


FIG. 85.—Peculiarities of the cavities of the ear: 1, Upper hollow with several branches; 2, upper hollow joined to edge of ear; 3, hematoma of upper hollow; 4, medium hollow horizontal; 5, origins contiguous; 6, sources separated; 7, vertical insertion of ear; 8, conch low; 9, conch high; 10, conch narrow; 11, conch broad; 12, conch pushed back; 13, conch crossed; 14, oblique insertion of ear.

## 2. WITH SPECIAL REFERENCE TO THE VIEW OF THE FACE



FIG. 86.—Points of full face view: *A-B*, Median line; *C-C'*, width of forehead; *D-D'*, separation of parietals; *E* and *E'*, internal points of eyebrows; *F* and *F'*, external points of eyebrows; *G* and *G'*, internal angles of eyelids; *H* and *H'*, external angles of eyelids; *H-G*, cleavage of eyelids; *O-O'*, opening of eyelids; *O*, upper eyelid; *O'*, lower eyelid; *J-J'*, breadth of nose; *I-I'*, separation of zygomata; *K-K'*, separation of cheek bones; *L* and *L'*, angles of the mouth.

## A. General Contour of the Full Face.

## 1. Synthetically.

Top shaped, lozenge shaped, pyramid shaped; square (broad), round, oval, rectangular, long (narrow); biconeave (narrow through the temples); asymmetric (to the left or right).

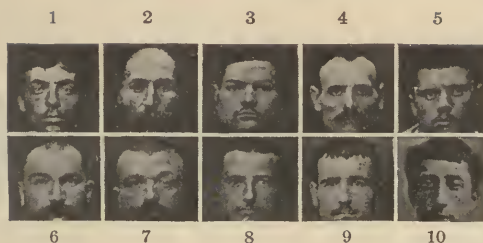


FIG. 87.—Contour of head (face view) from the synthetic point of view: 1, Top shaped; 2, lozenge shaped; 3, pyramid shaped; 4, biconcave; 5, asymmetric; 6, square; 7, broad; 8, round; 9, rectangular; 10, long.

## 2. Analytically.

Parietals divergent or convergent; zygomata divergent or convergent; jaws divergent or convergent; cheek bones prominent.



FIG. 88.—Contour of head (face view) from the analytic point of view: 1, Parietals divergent; 2, zygomata divergent; 3, jaws divergent; 4, cheek bones prominent; 5, parietals convergent; 6, zygomata convergent; 7, jaws convergent; 8, cheeks flabby.

## B. Fatty State.

Face full (fatty) or bony (thin); cheeks puffed out, hollowed, etc.



FIG. 89.—Fatty state of face: 1, Full (fatty); 2, thin (bony).

## C. Eyebrows.

### 1. Position.

Divergent or convergent; low or high; left or right higher.



FIG. 90.—Position of the eyebrows: 1, Convergent; 2, divergent; 3, low; 4, high; 5, asymmetric (left higher).

### 2. Direction.

Oblique internal or oblique external.



FIG. 91.—Direction of the eyebrows: 1, Oblique internal; 2, oblique external.

## 3. Form.

Strongly arched, rectilinear, or curved.

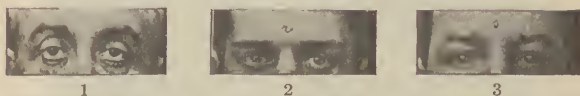


FIG. 92.—Form of the eyebrows: 1, Strongly arched; 2, rectilinear; 3, curved.

## 4. Dimensions.

Short or long; narrow (linear) or wide.



FIG. 93.—Dimensions of the eyebrows: 1, Short; 2, long; 3, narrow (linear); 4, wide.

## 5. Peculiarities of implantation.

Scattered, pigtail-like, thick set, united, brush-like, pencilled.



FIG. 94.—Peculiarities of implantation of eyebrows: 1, Sparse; 2, sparse with pigtail-like implantation; 3, thickly set; 4, united; 5, maximal in tail-like form; 6, brushy; 7, pencil-like.

## 6. Shade.

To be noted only when it contrasts with that of the hair.

## D. Eyelids.

## 1. Dimensions of the opening.

## (a) Horizontal.

Small (slightly divided); large (widely separated).

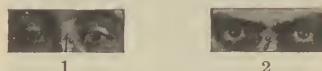


FIG. 95.—Horizontal dimensions of opening of eyelids: 1, Small; 2, large.

## (b) Vertical.

Small (slightly opened); large (widely opened).

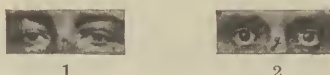


FIG. 96.—Vertical dimensions of opening of eyelids: 1, Small; 2, large.

## 2. Conformity of the upper eyelid.

Concealed or exposed.



FIG. 97.—Conformity of the upper eyelids: 1, Concealed; 2, exposed; 3, external angle raised; 4, external angle lowered.

## 3. Peculiarities of the eyelids.

External angle raised or lowered; fixed eyes; left or right upper lid drooping; overhanging of the external or entire portion of the upper lids; lower eyelids swollen, pouch-like, wrinkled, indented, reddened, watery, stripped of eyelashes, bleary-eyed, turned out.

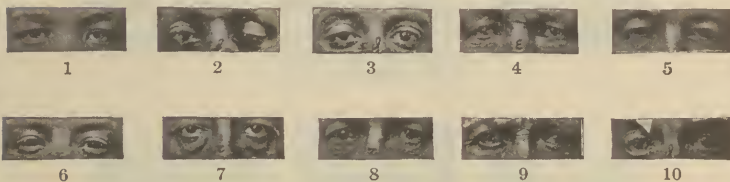


FIG. 98.—Peculiarities of the eyelids: 1, Fixed eyes; 2, left upper lid drooping; 3, right upper lid drooping; 4, external overhanging of eyelid; 5, overhanging of entire lid; 6, lower lids swollen; 7, lower lids wrinkled; 8, lower lids pouch-like; 9, bleary-eyed; 10, lower right lid everted.

E. *Eyeballs.*

## 1. Prominence.

Slight (sunken); marked (protruded).



FIG. 99.—Prominence of the eyeballs: 1, Slight (sunken); 2, great (protruding).

## 2. Peculiarities.

Iris raised; left or right convergent or divergent strabismus.



FIG. 100.—Peculiarities of the eyeballs: 1, Iris raised; 2, left convergent strabismus; 3, right convergent strabismus; 4, left divergent strabismus; 5, right divergent strabismus.

F. *Sockets of the Eye.*

## 1. Height.

Small or large; high or low.



FIG. 101.—Sockets of the eye: 1, High; 2, low; 3, hollowed; 4, full.

## 2. Peculiarities.

Hollowed or full.

G. *Interocular Space.*

Small or large.



FIG. 102.—Interocular space: 1, Small; 2, large.



H. *Wrinkles.*1. *Frontal.*

Total or median; curved, arched, rectilinear, or wavy.

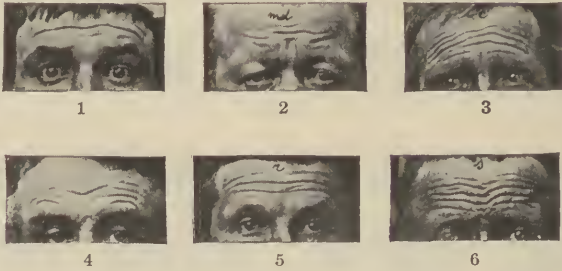


FIG. 103.—Frontal wrinkles: 1, Total; 2, median; 3, curved; 4, arched; 5, rectilinear; 6, wavy.

2. *Interpalpebral.*

Vertical and median; vertical and unilateral to the left or right; oblique to the left or right; horizontal and circumflex of the bridge of the nose; interpalpebral triangle.

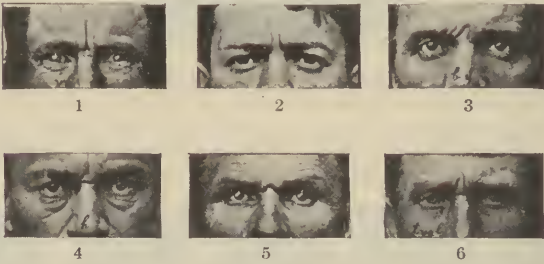


FIG. 104.—Interpalpebral wrinkles: 1, Vertical and median; 2, vertical and unilateral to the left; 3, oblique to the right; 4, horizontal of the bridge of the nose; 5, interpalpebral circumflex; 6, intra-palpebral triangle.

3. *Diverse.*

Temporal (crow's foot); tragian; nasolabial ridge; furrows of the cheek; vertical and horizontal wrinkles of the neck.

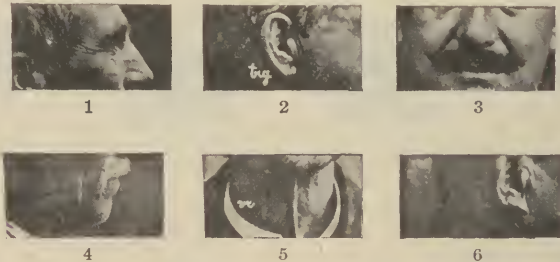


FIG. 105.—Diverse wrinkles: 1, Crow's foot; 2, tragian; 3, nasolabial furrows; 4, ridge of cheek; 5, vertical of neck; 6, occipital pad.

I. *Habitual Expression of the Physiognomy.*

Amazed, smiling, sneering, meditative, suffering, grimacing; air severe, energetic, haughty, solemn, or the reverse.

## III. CHARACTERISTICS OF THE ENSEMBLE AND DIVERSE INFORMATION

A. *Corpulence*

## 1. The neck.

## (a) Length.

Short or long neck.



FIG. 106.—Length of neck: 1, Short; 2, long.

## (b) Breadth.

Thin (lean) neck; large (fat) neck.

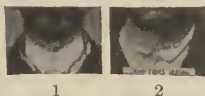


FIG. 107.—Breadth of neck: 1, Thin; 2, large (fat).

## (c) Peculiarities.

Larynx prominent; goiter; double chin; occipital pad.

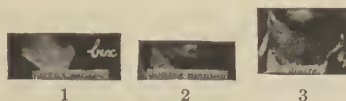


FIG. 108.—Peculiarities of neck: 1, Prominent larynx; 2, double chin; 3, goiter.

## 2. The shoulders.

## (a) Inclination.

Horizontal, intermediate, sloping; left or right shoulder drooping.

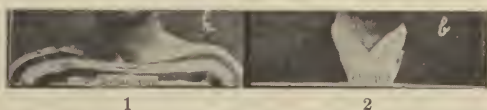


FIG. 109.—Inclination of shoulders: 1, Horizontal; 2, oblique.

## (b) Breadth.

Small, medium, broad.

## 3. The waist.

Small, medium, large.

B. *Attitude and Carriage of the Head.*

Stiff, arched, careless; head bent forward or backward; head turned to the left or right; back round; prominent shoulders; hunch-back; barrel chest; habitual position of the arms and hands; legs bowed, knock-kneed, etc

C. *Demeanor.*

## 1. The gait.

Slow or rapid, with small or large steps, feeble or strong, jumping or dragging, supple or stiff; rolling, with flexion, etc. Lame in left or right leg; club-foot; points of feet turned in or an exaggerated outward turn.

## 2. Gesticulation.

No gesticulation or a frequent one of the fingers, of the hand, of the arms, of the head; left-handed, etc.

## 3. The gaze.

Straight or oblique, keen or dull, fixed or mobile, slow or rapid, frank or evasive, sly, etc. Myopic, presbyopic; blinking; wears a monocle, eyeglasses, or spectacles.

## 4. Tics and mimicry.

Of the eyebrows, of the eyelids, of the nose, of the mouth; smokes, chews, or takes snuff; bites his nails, nails cared for; oscillatory movements of the eyeball, etc.

D. *Speech.*

## 1. Faults of articulation.

Stuttering; stammering, hesitation; lisping, pronounces z (as in azure) instead of z and s (as in shoe), pronounces z (as in azure) and s (as in shoe) like z and s, rolls the r's, nasal.

## 2. Timber.

Voice deep, sharp, feminine in the case of a man, and inversely.

## 3. Language.

Provincial, peasant of Seine and Oise, of Picardy, of Auvernat, of Gascony or Provençal; repetitions of the same forms of speech, etc.

## 4. Foreign accent.

Its origin; does it bear upon the vowels, consonants, or displacement of the tonic accent, with or without faults of style, of construction, etc.?

E. *Clothing.*

New or old; collar, cravat, cane, gloves, rings, footwear. Hat, its form in the language of the day. Hair dressed forward or backward, to the left or right, etc.

F. *Sociologic Presumptions.*

Ethnic or social origin, education, profession. Antecedents of all types.

G. *Anthropometric Observations and Diverse Information.*

Age, real and apparent; stature, length of head and chest. Length of right ear. Selection of other measurements which deviate notably from the average. Noteworthy peculiarities of the left ear. Form of the hand: narrow or broad, short or long, thin or fat (chubby); gnarled fingers, hairy fingers; ends of fingers tapering, square, or spatulate. Digital formula. Principal special marks.

In order to obtain sufficient precision in the description of the diverse forms and dimensions, the three terms of each series are increased to seven by the diminution and enlargement of the two extremes: thus, for the dimensions, instead of being called simply small, medium, or large, they are designated by the terms very small, small, slightly small, medium, slightly large, large, and very large; even the three terms, concave (abbreviated cave), rectilinear, and convex (abbreviated vex), form the following series, very cave, cave, slightly cave, rectilinear, slightly vex, vex, and very vex. The gradations of these series are sufficiently close, in order that confusion, in practice, may be admissible only between consecutive terms. In the writing of the signalments, the word "slightly" is replaced by the parentheses and the word "very" by an underline.

The average or intermediate characteristics are not sufficient to permit one to distinguish a person, hence, on account of the frequency of these average forms, they do not figure greatly in the signalments, being written down only rarely. There are only about a dozen indications when these average forms are of importance, all of which are relative to forms and dimensions departing from the usual, and, even

then, only when they are of such a nature as to make a person, who has been described by the signalment, recognizable among others.

When a police agent starts on his investigation of a criminal, he receives not only a photograph of the individual to be arrested but also a copy of the descriptive signalment upon which the non-average characteristics of the subject have been written (see Fig. 19B). The agent is thus able to analyze, to describe, and to learn by heart the photograph and to preserve a lasting impression of it. This permits the putting into practice of the idea of which a résumé is given in the celebrated sentence of Peisse: "The eye sees in things only that which it looks at in them and it beholds in them only that which is already ingrained in the consciousness."

During the twenty years in which instruction in the "verbal picture" has been given regularly to the agents of the Parisian police and to those of the regional brigades of mobile police, cases of mistaken identity in the course of making arrests have completely disappeared, although such mistakes formerly frequently occurred. Teaching of this method is given, in its broad aspects, to students of legal medicine in Paris by Drs. Vibert and Balthazard.

### ALBUM D. K. V.

The descriptive characteristics are, likewise, utilized for the classification, in special albums (see Fig. 110), of the photographs of certain categories of individuals, who are dangerous to hunt and, especially so, to arrest. This classification is made of such a sort that the elements necessary for conducting an investigation in these albums may be taken up rapidly without attracting the attention of these individuals who are at liberty. In the first place, the photographs are divided into 3 fundamental categories according to the form of the ridge of the nose: cave, rectilinear, or vex. Each of these categories is then divided into 7 groups, arranged in an immutable order by means of the abnormal forms of the ear previously mentioned. We distinguish the form called, for short, deq (see Fig. 111) by a lobe adherent to the cheek throughout its entire length, whether it be sloping or square; in the form car, the line which terminates the antitragus describes either an upward curve or one to the right; in the form vex, the antihelix is in relief with relation to the posterior part of the helix; in the form tra, the lobe, traversed by the prolongation of the helix, presents a hollowed out pattern; by the term sep, we designate a lobe separated from the cheek either in the form of a contour or in that of a deep furrow; the abbreviation sa has relation to the antitragus, the profile line of which describes a well-marked or projecting angle. Finally, ears which present none of the characteristics above mentioned are placed in the seventh group called X.

The photographs of the first five of these groups are, then, subdivided into 2 or 3 subgroups by means of the character of the ear which is of secondary importance, following the order deq, car, vex, tra, sep, sa, and X. Thus, it happens that a photograph presenting the forms



deq and vex will be classified in the group deq and in the subgroup vex. These subgroups are divided into 2 or 3 divisions by means of the height of the body, and these subdivisions are again split into 2 or 3 subheads according to the age of the individual. This last group,

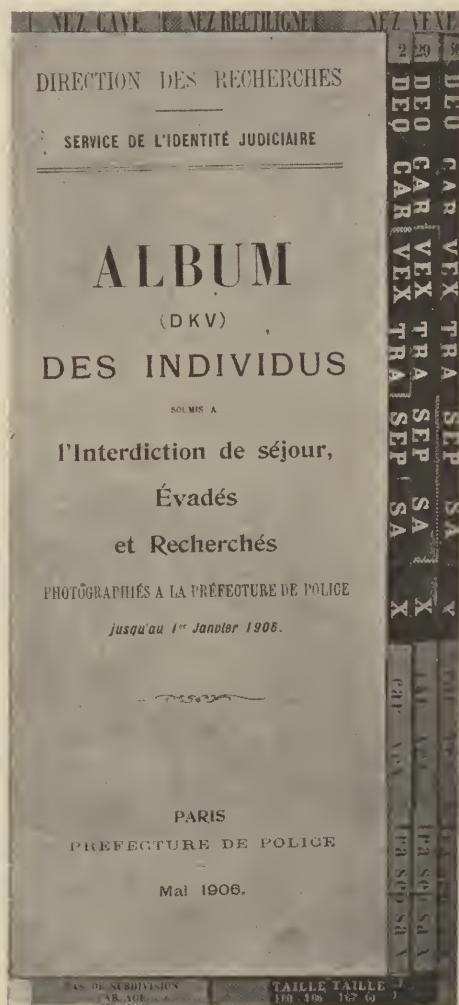
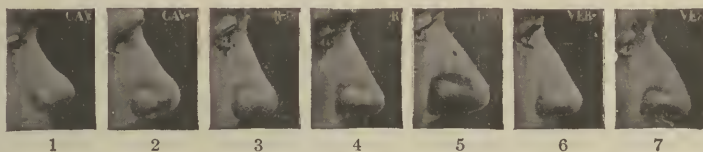


Fig. 110.

which is never more than 20 in a total of 3000 photographs, is represented by a card of 2 pages, in which the photographs are arranged according to the color of the eyes, light on the left and dark on the right. Finally, the inclination of the base of the nose determines the order of the pictures on each page (see Fig. 112). At the bottom of each photograph, following the statement of the civil status of the subject con-

cerned, appears the inscription of the peculiar marks (such as cicatrices or nevi) found upon the body or hands, which will strengthen, at the time of arrest, the certainty of identity given by the photograph.

In order to assure himself rapidly that an individual, encountered in the street for example, is classified in the Album D. K. V., the detective examines the profile of the individual without attracting his attention, notes in a few seconds his signalment called D. K. V., that is to say,



Seriation according to the line of the ridge of nose. Normal forms: 1, Cave; 2, cave-rectilinear; 3 rectilinear-cave; 4, rectilinear; 5, rectilinear-vex; 6, vex-rectilinear; 7, vex.



Characteristic forms of the right ear: 1, Deq; 2, car; 3, vex; 4, tra; 5, sep; 6, sa.

FIG. 113.—The nose and the ear from the point of view of classification in Album D. K. V.

notes the form of the nose and the anomalous forms of the ear in the order indicated above, then, concealing himself as much as possible behind the angle of a door or in a cafe, looks in his list for the signalment which he has just made.

Albums of this sort, made up for individuals submitted to interdiction of sojourn, for foreigners expelled from France as a result of sentence, and for convicts escaped from prison, lead each day to the arrest, upon the public streets of Paris, of a large number of these delinquents.





## SPECIAL MARKS AND TATTOOING

We have already had occasion, under the subject of identification between photographs, to speak of the decisive rôle of special marks in solving questions of identity. This is the one field without precise limits, in which the investigator has the greatest opportunity of showing his personal initiative and his anatomic knowledge, because there may be marks either made at birth or acquired, the latter arising either from the interior (pathologic conditions) or from the exterior (traumatisms, etc.).

Everybody has some sort of special marks, by which I mean moles, cicatrices of cuts on the fingers, cicatricial points of furuncles, without speaking of anomalies of the nervous, dental, or pilary system, or even of cicatrices of wounds from side or firearms, caustic burns, cicatrices of abscesses, etc. A description of a most commonplace mark may become of the greatest usefulness in the final recognition of an individual, if the most rigorous precision has been employed in the description of the mark and the noting of its position. The ideal to be attained in this work should be that a person working in another place may be able, after reading a description of this sort, to reproduce on his own body drawings imitating exactly the marks of the individual signalized, as far as the general aspect, the form, dimension, and position are concerned. Therefore, it is less the existence, the actual verified presence of this or that peculiarity which characterizes the individual than its rigorous localization, since everybody or almost everybody presents some analogous marks.

The anatomic vocabulary suffices for every description, unless it becomes necessary to make some special remarks. Let us add, however, that for the maternal nevus one should note the popular descriptive appellations, which the bearer gives to it and which are, most of the time, very figurative, as, for instance, coffee grains, bunch of currants, bunch of grapes, pork rind, etc. For cicatrices and marks, one will make a note of the origin which the subject furnishes him regarding them, with the statement that the subject declares that this is a cicatrix of a stab wound or that it is due to the crushing of a phalanx in the gearing of a wheel, etc. The age of the cicatrix will be, likewise, noted approximately, especially when this does not appear to have reached its definite stage of evolution. The cicatrix, says Lacassagne, is not a simple indelible mark for it permits of proving a fact in the existence of the accused and of reconstructing the circumstances of an occurrence. Therefore, it is very often of great importance, whether it be a question of establishing the identity of an individual who has disappeared for some time or, on the contrary, whether it fails to disprove or actually proves the identity of an accused subject.

By tattooing is meant every sketch or spot (generally blue or red) resulting from the depositing under the epidermal layer of the skin of a more or less unalterable coloring substance of mineral or vegetable origin. According to the statements of Cook and of Dumont d'Urville, the



word is of Oceanian origin, being derived from "tatou." Tattooing has been practised, however, from time immemorial and by all peoples. Generally, with civilized races, the sketches are made point by point by pricking into the interior of the skin with a small bundle of fine sewing needles soaked in a solution of China ink (see Figs. 113-115). The bluish impression of the sketch, which does not appear in all of its clearness until after cicatrization (a matter of eight to fifteen days), results from phenomena of irisation analogous to those which the irises of blue eyes present, although they contain only a uvea of absolute



FIG. 113.

black. Bluish tattooings of larger aspect may also be obtained by dermic incrustations with black gunpowder or of wood charcoal finely powdered and mixed with water. The red coloration, which is less resistant than the blue, is usually given by vermilion. The somewhat complicated designs are generally outlined on the skin by means of pencils or stencils, whose tracings are pierced and then incrustated point by point. There are, it seems, instruments which produce the entire design at one application by means of a sort of plate inlaid in relief with needles. As the tattooing artists have at times in the course of their work occasion to use their own saliva for cleansing purposes in re-

moving traces of blood or to efface a sketch badly made, syphilitic infection or abscess formation may oftentimes result.

When one describes a tattoo mark upon a living subject he should use every effort to describe not only the form and the dimensions of the sketch but also its situation as exactly as possible, in order that its primitive location may always be reconstructed in case of attempts at destruction or effacement.

The process most frequently employed for causing a tattoo mark to disappear is to make another tattoo in such a way that the new one utilizes and disguises the contours of the old one to the greatest possible degree. The factitious tattooing may be recognized by the fact that the



FIG. 114.

added marks have lines which are thicker and more shaded in order to hide the tracings of the portions of the old sketch which are not utilized. As the operation of tattooing is somewhat painful, the first tattooings which a person has are usually of simple design. It is not rare to encounter some attempts which have been abandoned almost as soon as they are begun. Dr. Variot of Paris is the originator of a process for removing tattoo marks, which has given good results. This consists in reprimicking the skin with a bundle of needles impregnated with a solution of tannin and of touching it strongly, immediately thereafter, with a stick of silver nitrate. He brings about, in this manner, the formation of an eschar, which destroys the skin superficially as well as the tattooing which is incrustated upon it. This operation demands that several

attempts be made at intervals of some weeks, a cicatrix forming which resembles that of a vesicatory.

Opportunity has been given us of studying some tattooings artistically traced upon the arms and ankles of some Englishmen of the



FIG. 115.

upper class. Hence, one should not infer anything regarding the social position of the subject from the simple fact that he may have been tattooed. The interpretation of the views or of sentences expressed is more instructive from the psychologic viewpoint.

Dr. Lacassagne of Lyons, who has made a deep study of tattooings, divides them as follows: religious or patriotic, professional, sententious, antimilitary or antipolice, amorous, erotic, fantastic, and historic. Moreover, tattooing is often employed by young criminals as a sign of initiation into some secret organization. Thus, the members of the band of "Five Points" must all bear a similar mark upon the back of the hand between the thumb and index-finger. For other organizations this mark may be a unique point upon the right temple, etc. Let us point out, finally, that mine workers, blacksmiths, file grinders, etc., very often present on their hands and, occasionally, on their body points of involuntary tattooing, which have arisen from the introduction of particles of carbon or pieces of steel into the thick part of the skin.

To sum up what we have said, although tattooings are an important means of identification, it is not wise to exaggerate their value. Their interpretation should be made with discernment. They may be purposely modified and, even, sometimes effaced. Finally, it is not rare, when a criminal assumes the civil status of another person and this latter bears tattooings, that the former causes himself to be tattooed in the same manner in order the better to play the rôle of the latter person.

## FINGER-PRINTS

As a result of the general spread of knowledge concerning the methods of "anthropometric signalments" and of the "descriptive photograph" originated by Bertillon and because of the social necessity of establishing in each country a list of criminals, questions of identification became the order of the day in the scientific world and, on all sides, attempts were made to perfect the methods already existing.

In England, Mr. F. Galton, after having maintained some lively polemics on the subject of the anthropometric methods of Bertillon, brought again before the public and completed the work of Purkinje (published in Breslau in 1823) regarding the extremely capricious tracings presented by the papillary ridges of the extremities of the fingers, of the palm of the hand, and the soles of the feet. The principle of this method depends upon the unchangeability, which is well established, of these patterns from birth even to death. Their surface extends naturally with the growing organism, but the relations of the lines and, especially, their number, their points of bifurcation, their infinitely variable methods of curving, remain absolutely the same. The principal advantage of the system rests upon the extreme simplicity of preparing the individual cards, which may be reduced to a single imprint of the ten palmar digital surfaces.<sup>1</sup>

The surface of a copper plate or of well-polished zinc (or even a piece of plate glass 20 cm. long by 10 in width for instance) is lightly

<sup>1</sup> Attention should be called to the fact that finger prints are now used as a means of identification in most of the armies of the world. Further, it is to be recalled that Mark Twain in 1893, in his *Pudd'nhead Wilson*, introduced this method of identification into fiction. (The Editors.)



smeared with printer's ink, which should be spread out in an even layer by means of a small roller. The extremities of the fingers, of which the papillary tracings are desired, are now rolled from without within on this well immobilized plate and, then, by a repetition of the same movement, a rolled impression is transferred to the card or signaletic sheet intended for the records. The imprint obtained reproduces exactly the curvatures of the papillary ridges. These tracings will be clear if the ridges are sufficiently prominent and if the impression has been made by a continuous roll, without any stopping or turning back in the process. The rolling movement has for its object the obtaining of complete digital tracings with the lateral points of triangular bifurcation called  $\Delta$  (delta) and not, simply, the middle of these tracings, which the non-rolled application of the four contiguous fingers will give.

Having obtained the card in this manner, the difficulty of systematizing it arises, in other words, the difficulty of describing and classifying it in such a manner that it may always be found again at a later period to aid in identifying a new imprint received. It is to the initiative of Sir E. R. Henry, Chief of the Metropolitan Police of London, that we owe the first practical method of classifying finger-prints as well as the establishment of an administrative bureau of identification for individuals already condemned, which bureau even at the present time renders to justice the same service as does the anthropometric signalment of Paris in regard to identification.

It should be remarked at this point that finger-prints do not constitute a signalment in the strict sense of the word, but are simply a sort of seal, which is very personal, very convenient to distinguish, and one which every individual constantly bears with him. However, one of the objections against the exclusive employment of finger-prints, in establishing a general registry of identification of criminals, is that it is not rare to encounter criminals who bring about a change in their imprints by wearing off the epidermis by rubbing upon their trousers or upon stones. Others attempt to produce small superficial ulcerations by forcing under the epidermis septic material, such as urine, dental tartar, etc., which produces, in the end, indelible cicatrices which either disfigure or change the digital tracings to such an extent that they become unrecognizable. In spite of this and of the evident insufficiency of the digital imprints in establishing a signalment, it became the fashion for a time in certain places (such a seductive attraction do things new and not clearly understood exert) to disregard completely the anthropometric measurements of the Service of Legal Identity. At any rate the dactyloscopic system is unable to supplant photography or the "verbal picture," nor does it permit of the identification of an individual sought through the agency of his clothes, hat, footwear, or gloves, which may often be the items of chief interest in legal inquiries. Moreover, one may state that it is easier and more exact to measure a middle finger or a cephalic diameter than it is to count the papillary lines in the very numerous forms E of the imprints.

## TECHNIC

The technic of the various methods of classifying finger-prints is very simple. All anatomists, who have interested themselves in this matter, recognize four types of tracings: (1) the curves or loops turned either to the right or left; (2) the more or less circular forms (whorls); (3) the spiral or scroll-like forms; and (4) the arched forms (see Fig. 116). The frequency of these different tracings is very unequal. Thus, for the first four fingers of the right hand, the form E comprises alone about 57 per cent. of the total; the form O, 28 per cent., the form U, 10 per cent.; and the form I, 5 per cent. The forms of the left hand are in close correlation with those of the right hand. In the French anthropometric lists, which utilize directly the methods of notation used by Galton, the finger-prints are principally applied to the classification of signalments of minors and of women. When it is a question of the right hand, these four forms are designated as follows: by the letter E, loops oblique to the right; by the letter I, loops oblique to the left; by the letter O, circles (whorls) or spirals; and by the letter U, the arched forms.

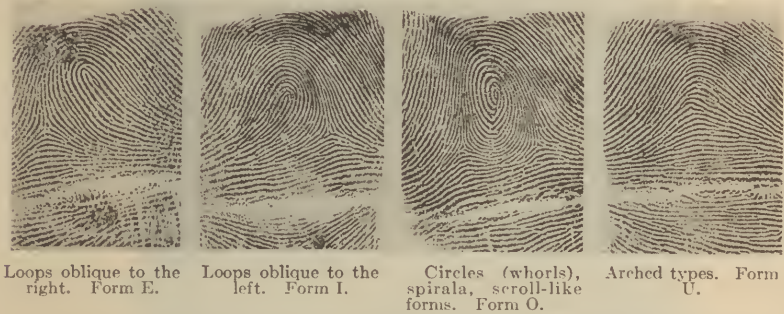


FIG. 116.—Specimens of the four fundamental forms of finger-prints (right hand).

the letter O, circles (whorls) or spirals; and by the letter U, the arched forms. For the left hand, the letters are replaced by figures; 1 corresponding to I; 2 to E; 3 to O; and 4 to U.

The classification is begun with the left hand. The symbols of the 5 fingers of this hand, inscribed side by side, form an arrangement of 5 figures. Hence one may form  $4^5$  or 1024 different arrangements. Many of these combinations are encountered very rarely and others, on the contrary, are extremely frequent. For these latter combinations other means of separation are, therefore, necessary. In the first place, the right hand is employed, which is, also, able to furnish 1024 categories ranging from EEEEE to UUUUU, so that, in theory, one may obtain  $1024 \times 1024 = 1,048,576$  different groups. In reality, this is far from being the case. To give an example, taking only the first four fingers of the left hand it is noticed that almost one-third of the signalments group themselves under the 3 series, 1111, 1121, and 3333. It is the same for the right hand. When one has found the subdivision for the right hand, there remain some categories much too numerous still for one to be able to make rapid investigations. In this case, one has re-

course to a tripartite division based either upon the number of ridges existing between the central point and the triangular point in the loop formations (see Fig. 117) or, when it is a question of spiral or circular formations having two triangular points, utilizing the differences of the tracings which are presented by the curved lines leading from the left delta. This curve may, in reality, pass to more than 3 ridges above and to the left of the second delta point (internal form I) or may pass to more than 3 ridges below and to the right (external form E), or may take an intermediate course (median form M) according to a method borrowed from Henry (see Fig. 118). The number of subdivisions which may be formed in this manner with the 5 fingers of the right hand (supposing all to be of the form E, I, or O) is  $3^5$ , or 243. More-



FIG. 117.—Counting of ridges in Form E (twelve ridges).

over, if need be, there is nothing to prevent the application of this method of classification to the fingers of the left hand, but it is evident that the counting of the ridges, necessitating as it does the use of the lens, is an operation more delicate and more subject to error than is the direct appreciation of the form of the whole.

In the English system the attempt is made to make the primary groups as nearly equal in number as possible. To accomplish this, E. R. Henry groups the fingers two by two, taking them in their natural order and beginning with the right thumb. In this preliminary division only 2 forms, the loops L and the whorls W, are distinguished. The pairs of fingers are thus noted: Thumb/Index; Middle/Ring, etc. Each card bears a formula of this nature, L/L, L/W, W/L, W/W, L/W, which determines the primary case from which it may be classified.



The number of categories which may be formed is  $4^5$ , or 1024, which is the square of 32. If a large filing case be made, comprising 32 horizontal rows and 32 vertical columns, one will be able to designate each category by two numbers from 1 to 32 placed in the form of a fraction; for example, 13/18 will designate the case situated at the intersection of the thirteenth vertical column with the eighteenth horizontal row. This fraction is rapidly obtained from the digital formula given above by the application of the numerical coefficients diminishingly applied to the forms W, according to a very simple process. In the interior of these cases the subdivisions are arranged in a manner quite varied,



FIG. 118.--Determination of the tracing of the loop leading from the left delta in form O (internal tracing, five ridges).

but always starting with the index and middle fingers as chiefs of the file. The last subdivisions are, then, obtained by counting the ridges or loops emanating from the left delta as previously explained.

The Italian system of Gasti is the latest one introduced. This attempts to be purely numerical. To arrive at this end, Gasti distinguished 10 forms designated by the 10 numerals. He obtains this number by dividing the forms E into 3 classes (by means of counting the number of ridges) numbered 3, 4, and 5, and the forms O into 3 other classes numbered 6, 7, and 8, by means of the tracing of the loop emanating from the left delta. This collection of the 10 fingers forms, then, a number of 10 figures, which may be classified in a numerical order.



However, the simplicity of this classification is more apparent than real, on account of the numerous indefinite and intermediary forms which one encounters in practice, certain forms being even limited to 3 categories. This system seems to have been inspired by the decimal nomenclature and, at the bottom, rests simply on the general principal of numeration.

Many other systems of classification have been presented by the specialists, but we will not speak of them here, for we believe this would be useless since, whatever be the order of elimination, one always comes, sooner or later, to the grouping together of similar forms as the most numerous. For this group, the problem of classification is already complete.

**Investigation and Revelations of Imprints Found at Places of Crime.**—Taking advantage of his great authority, we quote, from the treatise on Legal Medicine by Prof. Vibert of Paris, the following lines, which bear directly upon the subject with which we are dealing: "Sometimes one finds upon different objects prints of a hand or of bloody fingers. It is to be realized that these marks may give, in certain cases, some useful information concerning the manner in which the crime has been committed, concerning the later actions of the murderer, or regarding the presence of accomplices, etc. However, it is not necessary that the hand be bloody or stained in any manner whatsoever, as it is sufficient if it be moist at the moment of contact and that the object touched be polished. If, moreover, the removal of the finger after the contact has been made perpendicularly to the surface of the object touched (without drawing it along in any way), as when the hand leaves a glass or bottle upon a table, the mark left on the object reproduces with clearness the papillary lines. It is no longer a simple stain, but an imprint. This print reproduces the papillary tracings which cover the palmar surface of the hand and the fingers, owing to the contact of the perspiration and of the fatty matters which are deposited on a level with the papillæ. It may be realized what conclusions may be drawn from these facts in medicolegal practice. By comparing a finger-print clearly made by the fingers with the imprint taken of the hand of a suspect, one may affirm his actual presence at the place of the crime at a given moment, if the two imprints are found to be exactly similar. This method has often permitted the identification of a criminal. For example, in the following case of Bertillon, a thief had made his entrance into a room and had broken the glass of a piece of furniture; on this glass were observed some imprints of the finger tips, which were photographed and, at the same time, enlarged in order to facilitate the examination. In looking through the signaletic cards which he possessed, Bertillon found one whose finger-prints were identical and was able to recognize in this manner that the thief was a man named Sch—. Although imprints upon glass lack a little clearness, as a result of the removal of the fingers, a somewhat close comparison will suffice to convince one that they belong to the same individual, who has furnished the imprints taken by the Bureau of Identification (see Figs. 119, 120).

Among other cases of Bertillon, let us cite, especially, the one of the assassination of Madame L.: the murderer, S., had left upon a bottle the imprint of his right index-finger; he was convicted and sentenced to heavy labor for life (Assises of the Seine, Mar. 28, 1906). Further, the case of the assassination of the Widow M.: Upon a bottle were found the imprints of the middle, index, and ring fingers of the nephew of the victim; he was sentenced to ten years at hard labor (Seine, 1905).” Finally, in the recent affair of the automobile bandits, two of them, Carrouy and Metge, were identified through the prints of the fingers



FIG. 119.—Finger-print of the accused.

and thumb left upon a highly polished mahogany writing table, which they had broken (Paris, 1912).

The investigation should be, in most cases, limited to surfaces which are brilliant and polished, such as mirrors, drinking glasses, bottles, lamp chimneys, printing paper, woodwork and knobs of doors, glass inkstands, jewel cases, polished metallic toilet articles, all parts of polished wood, and, in general, upon all surfaces which have been submitted to pressure, especially in case of breaking open of furniture, doors, deposit boxes, etc. All such surfaces should be examined with the

aid of a light coming from an acetylene burner or from an electric projector. The imprints upon glass show up very well under a certain incidence of light. As regards the prints on polished wood, it is to be said that it is almost impossible to discover them by this simple inspection. In such cases it is necessary to bring them out by means of smooth, finely powdered white lead, as we have indicated in the *Revue Scientifique* in 1897. It will be sufficient to take up some of this powder on a soft brush and to rub this in every direction over the

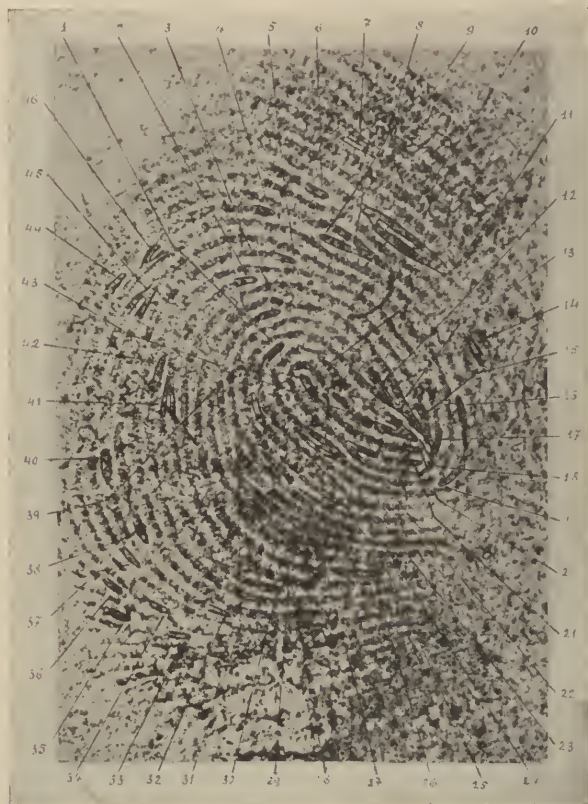


FIG. 120.—Identification by means of finger-print. Imprint found upon furniture and brought out by means of white lead.

suspected surface. Working in this way, one will soon see the papillary lines appear in white with great clearness. If necessary, a light rubbing over with a dry brush will clear up the lines and render them very apparent.

As regards the imprints upon glass, it is preferable to reproduce these directly by photography without powdering them, unless they are found on glass of deep color and opaque. If the surface which bears the imprint is smooth and transparent, such as plate glass, window glass, etc., excellent reproductions may be obtained by placing



the object in front of a black background and lighting it at an incidence of about 45 degrees. It is essential that the background remain absolutely black in spite of this lighting. By proceeding in this manner one obtains, without any other precaution and without having recourse to any complicated methods, a very detailed picture, the filigree-like depths of the ridges of which appear in pure black. It is well to remark, in this connection, that the plate thus obtained will give an imprint on the positive form, but one that is inverted as in a mirror.

In cases in which the imprint is found on a drinking glass or upon a bottle, of which the glass is transparent, the work should be conducted with a direct light, care being taken (1) to place the source of



FIG. 121.—Photographic reproduction of an invisible finger-print (direct lighting upon a black background).

light (electric) very near the objective and (2) to fill the bottle or glass with a black liquid such as China ink (see Fig. 121). On account of the curvature of the cylindric surface one is often obliged to make two or more successive plates in order to obtain the entire surface of the spot. Finally, imprints outlined in white by the white lead are photographed directly according to the usual rules.

It still remains for us to speak of imprints found upon paper. The best means known at the present time is to submit the paper to vapors of iodine in a closed vessel. The papillary lines appear then in dark yellow on a clear yellow background. However, it is necessary to be quick in photographing them, for they are removed very rapidly on account of the volatility of the iodine.



Comparison of imprints, found at the places in which crime has been committed, with those of suspected individuals, is generally carried out with photographic proofs enlarged five times. All the salient peculiarities, such as triangular points, central points, ends of lines, bifurcations, islands, etc., are surrounded with a small red border and they are annotated with a number in such an order as will permit of their recognition at the time of the demonstration, which will have to be made before the court (see Figs. 119, 120).

**General Considerations Concerning the Signaletic Value of Portions of Finger-prints Found at the Places of Crime.**—The filigree-like outlines made by the papillæ of the digital extremities are an element of identification absolutely certain, when the outlines formed by the ten fingers are arranged in a manner such as is shown on the anthropometric card. The imprint of a single finger, or even of a part



FIG. 122.—Fragment of finger-prints offering sixteen common peculiarities: A, Print from the right ring finger of C., born in 1869. B, Print of right middle finger of M., born in 1855. (Enlarged four times.)

of a finger, is sufficient for identifying a subject among a hundred thousand others on the condition that the outline is clear enough and extensive enough to permit of the reproduction, especially, either of the center (point or line) or of one of the points of lateral bifurcation called the "delta point" and, moreover, of a certain number of peculiarities, the topography of which may be identical upon the two kinds of documents at hand. At the same time one should determine the total absence of dissimilarity between the parts which are clearly visible. The number of peculiarities necessary to assure an identification varies, naturally, according to the degree of originality of the outline, it being estimated that the number of ten to fifteen is sufficient to give our conclusions a degree of probability approaching certainty. It is important to add that one sometimes finds, with brothers and especially with twin brothers, finger-prints which offer, to a certain extent, a number of common peculiarities which may reach or exceed this figure. The only method of eliminating completely this supposition, in case the

accused has a brother who may be a possible subject of suspicion, is to collect, likewise, the prints of the fingers of this brother and to assure oneself by a special examination that his imprints do not present the ensemble of peculiarities shown by the prints of the incriminated subject. This will almost always be the case, as a complete similarity of coincidence between brothers is only very rarely encountered. Nevertheless, such coincidences of form may exist, in support of which statement let us present here a striking example. The two portions of prints reproduced here (see Fig. 122) show a very great general resemblance accompanied by 16 common peculiarities. However, one of the prints is that of the middle finger of one subject and the other is derived from the ring finger of another subject, not a relative of the first. We hasten to state that, if we take a somewhat more extended zone,



FIG. 123.—Specimen of two finger-prints, A and B, presenting a large number of analogies and having been presumed to pertain to two individuals of the same family. (Enlarged two and a half times.)

there appear some decisive differences which prevent any conclusions as to identity. The same thing is true of Fig. 123 in which the number of common peculiarities reaches 50. These examples show, moreover, the importance of specifying, when one is able, the designation of the finger which produces the imprint examined. It very often happens that one finds several imprints simultaneously produced by the imprint of an entire hand and in which it is easy to deduce with certainty the position of the hand, whether right or left, and to designate to what finger each imprint necessarily belongs. This knowledge, by limiting the number of reconciliations necessary to be made with the authentic imprints, greatly increases the value of conclusions drawn from similarities of form. Thus, in the preceding example, it is evident that it is sufficient to know that the imprints compared arise from ten

different fingers in order that a conclusion of non-identity may be reached. Here are two other examples, which show that the general resemblance of forms may amount to only very little in the investigation of identity. The two series of imprints (Fig. 124) belong, in reality,

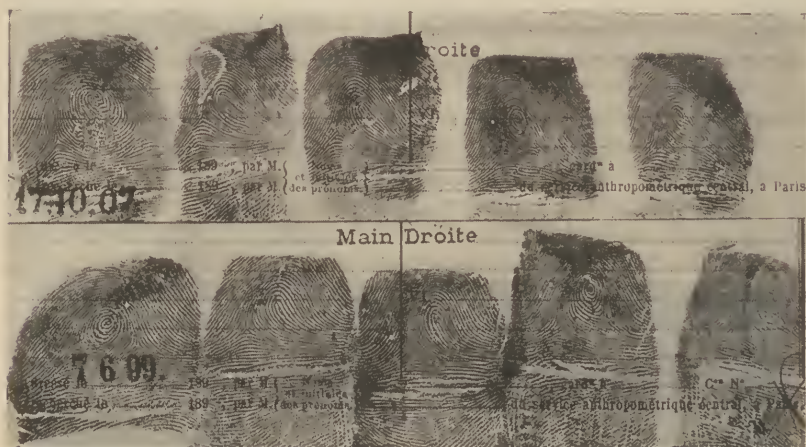


FIG. 124.—Finger-prints of two individuals who had interchanged their names and who were identified by their anthropometric measurements. Note the general resemblance of the last four fingers—index, middle, ring, and little fingers.

to two individuals, who have given the same civil status, but who are not twin brothers, and those of Fig. 125 belong to two sisters not twins. Aside from the thumb, one may conclude that the general forms of the

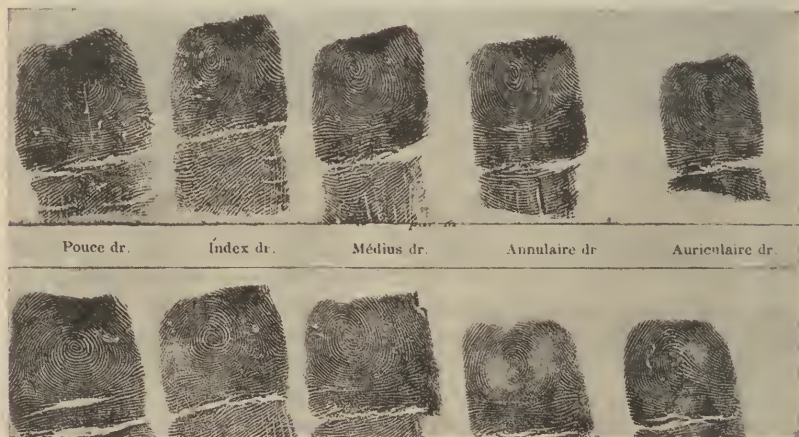


FIG. 125.—Finger-prints having a general resemblance and pertaining to two sisters, who are not twins.

other fingers of the individuals of the same names are very closely related.

It may be conceived that, by an appropriate deletion, there may be found, during the examination of numerous cards, areas sufficiently



extended, which offer a certain number of common peculiarities without any notable differences, but it is evidently improbable that portions of imprints, taken at random from criminals, will reproduce exactly the areas arbitrarily chosen. It is, moreover, wise to add that these outlines, which appear so similar at first glance, do not hold up under a minute comparison. Numerically, one will be able to find, for example, an equal number of ridges separating two single points, but the direction, the interval, the thickening, the incurvations of the lines are not absolutely identical, the one imprint with the other.

From these considerations it follows that identification by means of finger-prints is an operation, which demands, in order to afford every certainty, the support of a detailed medicolegal investigation. The two examples of deceiving resemblances, which we have just presented, show that the affirmation of identity rests less upon the number of common peculiarities than upon the certain absence of dissimilarity. It is, then, in a few words an induction based upon a negative result. However, in general such conclusions are ordinarily very slightly convincing from the purely philosophic point of view. Their value is derived solely from the recognized and already established competency of the medicolegal expert. This is a matter altogether personal to him, while non-identity is shown without further discussion by the determination of evident dissimilarities, which may be verified by everybody.



# IDENTITY

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**General Statement.**—The mutual recognition of friends who are associated at frequent intervals is a matter of daily occurrence which excites no thought of the principles on which rests an establishment of identity. Friends who have been separated for years usually require nothing more than a glance at the features to excite recognition and start a train of associations long since passed out of mind. The principle so fundamentally applied by Hume is here the basis of identification, for we know *by experience* that the possibility that another person, exactly resembling our friend, should appear under such circumstances need never be considered. If, however, the period of association shortens, or if the character of the association has been entirely commonplace, or if the separation has been sufficiently prolonged to allow the changes of time and occupation to stamp the features and estrange the mind, the recognition, even of former close friends, frequently requires the overcoming of surprise and momentary doubt. Instances of this sort are not infrequent where the ordinary changes in feature, voice, and character reduce the basis of recognition of friends solely to a belief in their verbal statements. The unreliability of such evidence, even in the ordinary affairs of life, and the credulity with which the average man accepts such imperfect proof, needs no clearer comment than the endless series of successful “confidence games” reported in the daily papers.

A distinctly new element is added to the problem when it is required to convince a third person of the identity of a friend, for the moment the question of a *proof* of such identity is raised by the third person a most delicate and difficult problem arises that has again and again taxed the finest sagacity of both lawyer and physician. This last situation always exists when the question of identity is brought before a jury, and the literature of legal medicine offers many famous instances in which the decision turned, often in an extremely dramatic way, upon the identity of individuals. It might be anticipated, from the indirect nature of conclusions drawn from the experience of the senses, and from the still more uncertain character of personal impressions, that mere verbal statements, in the absence of objective proof, are of little positive value in deciding questions of identity. The following well-known cases may serve to emphasize the unreliability of all evidence based upon individual belief and experience, and the frequent danger of

accepting accidental physical resemblance as concrete or positive proof of identity.

The Tichborne case, a full account of which may be found in Guy's *Forensic Medicine*, page 686, is probably the most instructive illustration of the foregoing statements yet recorded. A man, thought to be Arthur Orton, a butcher's son, claimed to be Sir Roger Tichborne and heir to the baronetcy and estates of Sir Roger, who was believed to have perished at sea many years before. In spite of the most striking dissimilarity finally demonstrated between this man and the real Sir Roger, the impostor was accepted by a score of witnesses, including seventeen servants, the family solicitor, and even by the mother of Sir Roger, who positively identified him as her son. It was only when the objective points in the stature, features, and accidental markings of the body, as well as the mental traits of Orton, were compared with those known to have characterized the real Roger that the comparative worthlessness of the very positive impressions of the friends and even of the mother's instinct was established and the impostor detected.

An older, and in some respects even more remarkable, case is that of Martin Guerre.<sup>1</sup> Guerre had been away from home for eight years and was presumably dead, when one Dutille, who must have shown the clearest possible physical resemblance to Guerre, was accepted by his wife, and assumed control of the property. For three years he lived in the same house with seven relatives, all of whom failed to detect the deception, and children were borne to him by Guerre's wife. Finally Dutille's worthless character began to assert itself, and aroused a train of suspicions which led to an indictment of the impostor. The legal inquiry, however, remained doubtful, or favorable to the impostor, until the real Martin Guerre appeared upon the scene, completely established his own identity, and secured the conviction of the adventurer. An examination of the account of this very remarkable case not only discloses the unreliability of individual impressions about identity, but also in a startling degree illustrates the uncertainty of all forms of evidence, even of the most objective nature. Not only was Dutille's claim actively supported by Guerre's wife and relatives, but he showed many of the physical peculiarities of the other, such as scars on the face, a single blood-shot eye, and four warts at identical points on one hand. His mental caliber and composition were somewhat similar to Guerre's; he accurately recalled many of the early experiences of Guerre, and even possessed family relics known to have been carried away by the absent man.

More tragic results of mistaken identity might be multiplied at length, for legal records contain at least several undoubted instances where innocent persons were executed on account of their pronounced resemblance to the real culprits.

Many notable errors have likewise been made in the identification of the dead. In the *Edinburgh Monthly Journal* for February, 1854, Dr. Hinloch relates a case of mistaken identity under the following

<sup>1</sup> Guy and Ferrier, *Principles of Forensic Medicine*, p. 40.

circumstances: The body of an old man was found on the bank of the Dee, at Drumoak. The left ear and the first finger of the left hand were wanting, the mutilation apparently of long standing. Two young women claimed the body as that of their father, who had lost his left ear and left forefinger, and who had been in the habit of remaining from home for weeks at a time. On the return of the daughters and friend of the supposed dead man from the funeral the boatman of a ferry which they had to cross asked them for whom they were in mourning, and on receiving their answer laughingly informed them that he had only half an hour before ferried their father over alive and well, which on reaching home they found to be true.<sup>1</sup>

On the other hand, some remarkable successes in the attempt to reconstruct and identify the dead body from mutilated fragments have been recorded. Of these may here be mentioned the case of Dr. Parkman, whose body was finally and positively identified by the absence of teeth in a fragment of the lower jaw, and that of Madam Houet, whose body was positively identified, and even the manner of her death, by strangulation, determined eleven years after burial.

It is probable that cases of mistaken identity are less frequent at the present day than formerly, and it may well be doubted if claims such as Orton's could be maintained with so much strength before the present courts. Yet recent legal records are by no means lacking in this particular, and many notable trials may be found in which a wide variety of evidence relating to identity has been thoroughly considered.

A recent instance in which an experienced detective was deceived in the matter of identity is quoted by Hamilton.<sup>2</sup> In 1887, Mr. A. Hedden, of Tacoma, was arrested on a charge of defrauding an insurance company out of a large sum of money. He had been mistaken for Mr. A. Crandall, of Buffalo, by Detective Poyne, of Cincinnati, who based his identification upon similarity in stature, features, color of eyes and hair, and especially upon the presence of a scar on the right foot. It was only after a bitter fight and the presentation of a considerable volume of evidence that Hedden secured his liberty.

A very instructive case, involving a great variety of evidence, is that of the Bryant estate.<sup>3</sup> Here the decision lay between five sets of claimants, coming from four different States of the Union, as well as from Nova Scotia and England, and all positively identifying the dead man as their relative. The decision rested largely upon the contents of a trunk owned by the deceased, which contained his certificate of citizenship and some old photographs, all of which were held by the court to give decisive evidence.

In the opinion handed down by Justice Mitchell are these significant statements: "Identity is one of the most difficult questions with which the administration of justice has to deal, and whether the witnesses have seen the party in question or not, their testimony as to recognition or identification is one of the least reliable facts."

<sup>1</sup> Ogston, *Medical Jurisprudence*, p. 67.    <sup>2</sup> *System of Legal Medicine*, i, p. 201.

<sup>3</sup> 176 Penna., p. 309, 1896.



The romantic history of the case of the Shehan estate seems well worthy of reference, both on account of its partial resemblance to the Tichborne case, in that the mother's instinct was proved at fault, and also as representing the varied character of the evidence affecting identification, and the positive nature of the proof required to establish the identity of a claimant to an estate. Here the claimant's case rested upon the presence of a large birthmark, by which, principally, the mother recognized the claimant as her child; striking resemblance to the father in person, movement, and disposition; and the early recollection by the claimant of a man whose nose had been destroyed by cancer, and who was a member of the family into which Shehan's child had been adopted. A full report of the history of this case, and the very able summary and opinion of Judge Hawkins in deciding against the claimant, may be found in the *Pittsburg Legal Journal*, May 21, 1890.

The important rulings in the above opinion are as follows: (1) A claimant to an estate must not only make out a *prima facie* case, but must sustain it by weight of evidence when attacked. (2) Personal resemblance by claimant to decedent, the existence of a birthmark on the claimant corresponding to a birthmark on decedent's child, and recognition of such claimant as such child by the mother, will not of themselves prove identity, although they may become important facts in the proof.

The inconclusive character of the evidence on either side renders this decision one of the most difficult yet recorded concerning the identity of individuals, far exceeding that of the Tichborne case, in which the falsity of the impostor's claims was fully demonstrated.

The general problem of personal identity, in so far as it concerns legal medicine, consists essentially in a study of the physical characteristics of the body. In the case of the living, it includes also an examination of the mind and memory of the individual. While a decision in some of these questions requires very little medical knowledge, many others demand a minute acquaintance with the laws of pathology, acquired only by the experienced physician.

The study of the physical characteristics of the individual involves the consideration of all the external features and of the natural and accidental changes that may affect them, while in the case of the dead body it requires also an examination of the viscera, musculature, and especially the skeleton.

**Age.**—It is always important, in the attempt to establish identity, to determine the probable age of the individual. The means at our disposal for this purpose are usually greater when dealing with the dead body, and the fuller discussion of this subject must relate almost exclusively to the examination of the cadaver. Considerable evidence, however, some of which is peculiar, can be elicited by an examination of the **living person**. One cannot do more, in the living, than determine the age within certain broad limits—that is, it can be said that the individual is in the period of infancy, youth, adolescence, old age, or senility; but a positive opinion cannot usually be given as to the



exact age in years without a thorough examination of viscera, musculature, and skeleton.

In **infancy** very accurate conclusions may sometimes be reached by the consideration of height, weight, number and condition of teeth, characters of the fontanels, and general development, but regard must be paid to possible wide variations due to precocious development or to disease. Prolonged malnutrition and congenital syphilis or rachitis may delay infantile development considerably.

In **youth** less accurate results are obtainable from physical examination, because physical changes are then less rapid than during infancy. Here the height, stature, and condition of the teeth are investigated as before, and, in addition, the appearance of the signs of puberty, such as changes in the voice and growth of hair, may give important indications.

In **adult life** it is very difficult or impossible to determine by physical examination the approximate age of an individual. As a result of personal idiosyncrasy, of the presence of a youthful type of countenance and a well-preserved complexion, and with a strictly healthful mode of life, the appearances of youth may be long retained or the approach of senile changes long delayed. On the other hand, a contrary physical idiosyncrasy, an elderly type of countenance, a complexion affected by malnutrition, mental care, or dissipation, premature baldness or the sudden appearance of gray hair, and the pronounced general changes due to arteriosclerosis, may have an influence in hastening the approach of the signs of old age during the period of adult life. Special importance here attaches to the early onset of arteriosclerosis, which may attack young adults and has been observed to run a fatal course even in youth. Premature baldness may occur without constitutional disease, when it often seems to show hereditary influence; or it may result from syphilis, which in the secondary stage produces a circumscribed temporary alopecia, and in the tertiary stage often a general permanent alopecia.<sup>1</sup>

In **old age**, which may ordinarily be considered to begin after the sixtieth year, nearly all the tissues show changes which are in themselves characteristic, but of which the onset, as stated, may be considerably hastened or delayed. As a result largely of atrophy of the subcutaneous adipose tissue the face loses its smooth outlines and usually its active circulation and high color. Wrinkles form across the forehead, at the outer angles of the eyelids, and at the sides of the nose, while the chin becomes more prominent and the features and expression become more fixed. The *arcus senilis* may appear in the cornea, and the eyesight commonly fails perceptibly. The general reduction of subcutaneous fat produces wrinkles and folds on the hands and about the axillæ and groins, and a sinking of the pulp of the thumbs. In women the integument of the abdomen may hang in large loose folds, and the mammæ are reduced in size and may become pendant. The circulation is enfeebled, the extremities are frequently cold, and the ready response

<sup>1</sup> British Medical Journal, 1880, pp. 114, 157, 197, 535.

to vasomotor excitation, as seen in youth, is wanting. The arteries are very generally found in some degree sclerosed.

The changes in the bony system visible externally may be noted in the inferior maxilla, which loses its marked angularity and suffers atrophy at the points where teeth have been lost. The neck of the femur shortens and assumes a right angle with the shaft. The intervertebral cartilages are partially atrophic, causing a slight loss of motion in the spinal column. This anatomic change at a more advanced stage and combined with loss of muscular tone produces the stooping posture and irregular gait which, with gradual failure of mental powers, mark the period of senility.

By the examination of the **dead body** it is often possible to determine the age more exactly than with the living. This greater accuracy results principally from the information derived from the study of the bones and teeth. The degree of ossification of the bones furnishes a very reliable guide in the determination of age. The rapid changes occurring in early life in this and other tissues permit much closer calculations at this age than at any other period. Barring certain exceptions to be attributed to rachitis and syphilis in youth, and to osteomalacia, gout, and rheumatism in adult life, the union of the various epiphyses of the long bones and the complete ossification of the shafts proceed in a very uniform sequence, and careful observations on the condition of the epiphyseal lines and ossification zones in the skeleton are the chief guides in determining the age of a dead body or of mutilated remains. For complete information regarding the periods of union of the epiphyses and the progress of ossification the reader may refer to Quain's or Gray's Text-book of Anatomy. The following table, compiled from Quain's Anatomy, gives the approximate periods of the appearance of the various centers of ossification and of the union of epiphyses and processes:

#### PERIODS OF UNION OF BONY EPIPHYSES AND PROCESSES

*First Year.*—Laminæ of some vertebræ; petromastoid and squamous portions of temporal; great wings and body of sphenoid.

*Second Year.*—Laminæ of lower sacral vertebræ; upper and condylar portions of occiput; frontal suture; lateral halves of inferior maxilla.

*Third Year.*—Basilar and condylar portions of occiput; fontanel nearly closed.

*Fourth Year.*—Basi-occipitals and exoccipitals; odontoid process of axis; fontanel closed.

*Sixth Year.*—Laminæ of upper sacral vertebræ.

*Seventh Year.*—Rami of pubes and ischium.

*Sixteenth Year.*—Lower epiphysis of humerus; coracoid process of scapula.

*Seventeenth Year.*—Upper epiphysis of radius and ulna; lesser trochanter.

*Eighteenth Year.*—Internal condyle of humerus; greater trochanter; head of femur; lower epiphysis of tibia.

*Twentieth Year.*—Greater tuberosity of humerus; lower epiphyses of radius, ulna, femur, and fibula.

*Eighteenth to Twentieth Year.*—Parts of acetabulum; auricular plates of sacrum; sphenoid and basilar portions of occiput.

*Twenty-first Year.*—Upper epiphysis of tibia.

*Twenty-second Year.*—Acromion and scapula.

*Twenty-third Year.*—Tuberosity of ischium; symphysis pubis; anterior inferior spine of ilium.

*Twenty-fourth Year.*—Upper epiphysis of fibula.

*Twenty-fifth Year.*—Heads and tuberosities of ribs; sternal epiphysis of clavicle.

*Thirtieth Year.*—Three coccygeal vertebræ.

*Middle Life.*—Union of coccyx and sacrum; greater cornua and body of hyoid.

#### PERIODS OF COMMENCEMENT OF CENTERS OF OSSIFICATION

*Sixth Month.*—Manubrium sterni.

*Seventh Month.*—First segment of body of sternum; astragalus.

*Ninth Month.*—Lower epiphyses of humerus and femur; upper epiphysis of tibia; cuboid; second and third segments of body of sternum; hyoid cornua; first coccygeal vertebra.

*First Year.*—Coracoid process of scapula; heads of humerus and femur; lower segment of body of sternum; os magnum; external cuneiform; anterior arch of atlas.

*Second Year.*—Greater tuberosity and lower epiphysis of humerus; lower epiphysis of radius; upper epiphysis of fibula; patella; internal cuneiform.

*Fourth Year.*—Greater trochanter; lower epiphysis of ulna; scaphoid and middle cuneiform.

*Fifth Year.*—Lesser tuberosity of humerus; internal condyle of humerus; upper epiphysis of radius; trapezium; semilunar; second coccygeal vertebra.

*Sixth Year.*—Scaphoid.

*Seventh Year.*—Trapezoid.

*Tenth Year.*—Olecranon process of ulna.

*Eleventh Year.*—Trochlear portion of humerus.

*Twelfth Year.*—Pisiform; cartilage of acetabulum.

*Thirteenth Year.*—Lesser trochanter.

*Fourteenth Year.*—Acromion process of scapula; external condyle of humerus.

*Sixteenth Year.*—Inferior angle of scapula.

*Eighteenth Year.*—Sternal end of clavicle.

After the thirtieth year the advance of ossification ceases and it becomes impossible, from the examination of the skeleton, to determine within narrow limits the age of the dead body. The effects of increasing age are, however, to be seen in certain *senile changes in the bones*.



Toward the close of adult life the bones become brittle, the fatty marrow is more abundant, the cancellous spaces may contain free fat, the lamellæ of the shafts and cancellous tissue are partly absorbed, the cavities are larger, and the bones become lighter and denser. The cranial sutures become completely ossified, immovable, and indistinct, although the parietal sutures may remain separate throughout life. "If the sutures of the skull are indistinct, we may fix the age between fifty and sixty years" (Tidy).

The gladiolus and xiphoid portions of the sternum usually remain separate until the thirty-fifth or the fortieth year, while the manubrium and gladiolus are not united until advanced age.

In adult life the first costal cartilage usually becomes surrounded by a superficial layer of bone, a process which extends slowly and with great variations over the other costal cartilages. These bony changes in the ribs are usually more marked in men than in women. The cartilages of the larynx become ossified, the greater cornu of the hyoid bone becomes united firmly to the body, and in advanced life the lesser cornu may also be united to the body.

The bodies of the vertebræ are beveled on their anterior edges, producing a moderate kyphosis, and the shrunk intervertebral disks are very flabby and inelastic.

The *lower jaw, in the infant*, shows a shallow body with the mental foramen near the lower margin, a short oblique ramus uniting at an obtuse angle with the body, and a coronoid process projecting above the condyle. In *adult life* the body becomes deeper, thicker, and longer; the condyle lengthens and projects above the coronoid process, and the ramus joins the body at nearly a right angle. In *old age* the loss of teeth causes an atrophy of the alveolar border; the mental foramen opens in this border, but the angle becomes again obtuse, reverting to the infantile type.

Even a superficial examination of the skeleton, with attention to those of the mentioned points that are readily accessible, will often fix the age with considerable exactness, while by a systematic study of the bones, although at the expense of much time and labor, very definite limits can be given in almost every case.

The recent investigations of Wachalz<sup>1</sup> on *the determination of age from the condition of the upper humeral epiphysis* are of interest in this connection. Wachalz found that the union of this epiphysis is influenced by the sex, the nationality, and the height of the individual. In 200 cases examined the cartilage at this epiphysis had fully disappeared in men between the ages of twenty and twenty-one years; in women, between the ages of seventeen and eighteen years. He also found that *the development of the marrow cavity in the shaft of the humerus is a reliable indication of age*. Between the thirtieth and the thirty-fifth year in men and after the twenty-eighth year in women the medullary cavity extends to the end of the surgical neck. After the thirty-fifth year in men and a little earlier in women it is found up to the epiph-

<sup>1</sup> Virchow's Jahresbericht, 1893, i, p. 489.



yscal line. The full development of the medullary cavity is retarded in very large bones, in dwarfs, or after wasting diseases. These observations were substantiated by Preuss,<sup>1</sup> who found, however, that the bony union of the upper humeral epiphysis was not complete in some individuals until the forty-fifth or forty-seventh year.

Some features of the *skeleton of the dwarf* are well illustrated in the description of a case by Paltauf.<sup>2</sup> The subject was a dwarf of forty-nine years of age, the skeleton resembling in many respects that of a child of seven years. The epiphyses of the long bones were ununited, and the synchondroses were still loose. The spheno-occipital synchondrosis and the sutures between the ilium, pubes, and ischium were cartilaginous. The diagnosis of an adult dwarfed skeleton was possible

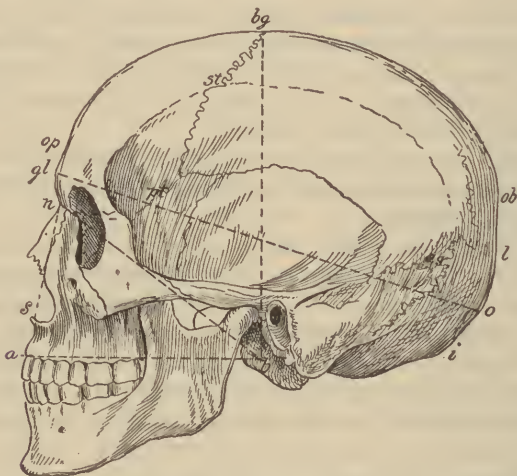


FIG. 126.—Side view of skull of a male Australian: *a*, Alveolar point; *s*, subnasal point; *n*, nasion; *gl*, glabella; *op*, ophryon; *bg*, bregma; *ob*, obelion; *l*, lambda; *o*, occipital point; *i*, inion; *b*, basion; *pt*, pterion; *st*, stephanion; *as*, asterion; *gl-o*, length of cranium; *b-n*, basinasal length; *b-a*, basi-alveolar length; *n-s*, nasal height.

from the condition of the skull and cranial sutures, from the well-developed ridges at the insertions of muscles, and from the distinctly adult form of the inferior maxilla.

**Race.**—The racial characteristics of the living or recently dead body are readily determinable from an examination of the skin, hair, and skull. When the skeleton alone is at one's disposal, craniometry may furnish the necessary data. The important features to be noted in distinguishing skulls of different races are: (1) *The cranial cavity*; (2) *the cranial length, breadth, height, and circumference*; (3) *the degree of projection of the jaws*; (4) *the form of the nasal skeleton*.

The **cranial capacity** is found by filling the skull with shot, of which the bulk is measured in another vessel. The measurements of the skull are taken from points located in the accompanying illustration.

<sup>1</sup> Virchow's Jahresbericht, 1896, i, p. 450.

<sup>2</sup> Ibid., 1891, i, p. 511.

The **circumference of the cranium** is taken in a plane passing through the ophryon anteriorly, and the *occipital point* posteriorly.

The **length of the cranium** is measured from the *glabella* to the *occipital point*.

The **breadth of the cranium** is the greatest transverse diameter above the supramastoid ridges. The proportion of the breadth to the length, or  $\frac{100 \text{ breadth}}{\text{length}} = \text{breadth index}$ .

The **height of the cranium** is measured from the *basion* to the *bregma*, and the height index is calculated in the same way as the breadth index.

The degree of **projection of the jaws** beyond the cranium, or *gnathic index*, is determined by comparing the *basi-alveolar length* with the *basinasal length* ( $b-a : b-n$ , Fig. 126).

An important characteristic of some skulls is the **nasal index**—i. e., the relation of the height and breadth calculated as before. The height is the distance from the nasion to the subnasal point ( $n-s$ , Fig. 126).

In the European the plane of the foramen magnum is inclined upward anteriorly. In the Australian and negro it is horizontal or inclined upward posteriorly.

The **pelvic index**—that is, the relation between the anteroposterior and transverse diameters of the pelvic brim—is, according to Turner, characteristic of some races.

The **orbital index** is the ratio of the height of the orbit to the width.

The craniometric and other skeletal indices of the four chief races, as compiled from Quain, are given in the following table:

CRANIAL INDICES

Cranial capacity.	Breadth.	Height.	Orbital.	Gnathic.	Nasal.	Pelvic index.
English . . . . 1480 c.c.	76	71	88	96	46	80
	Mesocephalic.		Mesoseme.	Orthognathous.	Leptorhine.	Platypellic.
Chinese . . . . 1430 c.c.	79	75	90	99	50	
	Mesocephalic.		Megaseme.	Mesognathous.	Mesorhine.	
Negro . . . . . 1350 c.c.	73	72		104	55	93
	Dolichocephalic.			Prognathous.	Platyrrhine.	Mesopellic.
Australian . . 1300 c.c.	71	71	81	104	57	97
	Dolichocephalic.		Microseme.	Prognathous.	Platyrrhine.	Dolichopellic.

Other important racial characteristics relate to the color of the skin, the hair, the orbits, and the lips. The English type of countenance needs no detailed description here. The Chinese, Japanese, and American Indian have yellowish-brown or dark reddish-brown skin, straight black hair, lips and orbital ridges not prominent, and the countenance peculiar in each case.

The negro has coarse, curly or woolly, black or brown hair, dark skin, protuberant lips, while the orbital ridges are not prominent. The Australian has black "frizzly" hair, dark brown or "chocolate-colored" skin, prominent orbital ridges, and thick, protuberant lips.

When any of these races intermarry, the offspring seldom present the racial characters of either parent exclusively. This fact, in addi-

tion to the great range of individual variation, often renders the determination of race difficult or impossible.

**Stature.**—The importance of the stature as a medicolegal inquiry has long been recognized, and has called forth much careful investigation, with the result that several systems for determining the height of the body from the length of one of the long bones have been proposed, tested, and, for the most part, been found to give unreliable results. J. M. Sue, cited by Tidy, more than a century ago was the first to attempt to calculate the total length of bodies from that of the trunk or extremities. From his observations it appeared that from the twentieth or the twenty-fifth year until old age the symphysis pubis forms the exact center of the body. Orfila's measurements of both body and skeleton showed, however, that J. M. Sue's conclusions could not be trusted perfectly, there being nearly always some difference in the lengths above and below the symphysis pubis. He offers other tables, based upon the length of the separate long bones, from which to calculate the total height of the body. It will be seen in these tables that the possible variations are so great that the average cannot be safely applied to individuals. It is a matter of common observation that the length of the limbs, especially of the arms, may be entirely disproportionate to that of the body. The application of Orfila's tables is, therefore, to be made with great caution.

#### ORFILA'S TABLES

TABLE I.—LENGTH OF BODY CALCULATED FROM LENGTH OF LONG BONES

LENGTH OF BONE.	Inches.	Maximum.	Minimum.	Difference.
Humerus, 19 observations.	14.5	68.1	64.5	3.6
Ulna, 14 " .	10.66	70.8	65.66	5.14
Femur, 12 " .	17.75	69.66	64.5	5.16
Tibia, 11 " .	14.21	69.66	64.5	5.16

TABLE II.—LENGTH OF SKELETON CALCULATED FROM LENGTH OF LONG BONES

LENGTH OF BONE.	Inches.	Maximum.	Minimum.	Difference.
Humerus, 6 observations..	13	73.25	69.75	3.5
Ulna, 7 " ..	10.66	73.25	65	8.25
Femur, 7 " ..	18.1	72	67	5
Tibia, 7 " ..	15	70.5	65	5.5

Other and more reliable tables have been prepared by the later French anatomists, Topinard and Rollet. The ratios adopted by Topinard<sup>1</sup> are as follows: Total height, 100; humerus, 20; radius, 14.3; femur, 27.3; tibia, 22.1. To the height thus calculated must be added 3.5 cm. for the soft parts. Rollet, after comparing the lengths of the long bones with the lengths of 50 male and 30 female

<sup>1</sup> L'Anthropologie, 1884.

bodies before dissection, deduced several methods of determining the height of the body, according to the shortest of which the total height is obtained by multiplying the length of the male humerus by 5.06, the female by 5.22, the radius by 6.86, or 7.16, the femur by 3.66, or 3.71, the tibia by 4.53, or 4.61.

Dwight<sup>1</sup> has studied in 56 male and 21 female subjects the relation of the length of the body to that of the spine, exclusive of its more variable portions, the sacral and coccygeal. These ratios were found to vary with the length of the spine as follows:

MALES.		FEMALES.	
Length of spine.	Ratio.	Length of spine.	Ratio.
Under 57 cm. (22 in.).....	2.93	Under 54 cm. (21 in.).....	2.94
From 57 to 60 cm. (22-24 in.)....	2.84	From 54 to 57 cm. (21-22 in.)....	2.82
From 60 to 63 cm. (24-25 in.)....	2.78	From 57 to 60 cm. (22-24 in.)....	2.79
From 63 to 66 cm. (25-26 in.)....	2.79	Above 60 cm. (24 in.).....	2.76
Above 66 cm. (26 in.).....	2.65		

The practical application of these ratios gave specially accurate results in the case of female subjects, but with male subjects the errors were slightly greater than those usually resulting from the methods of Topinard and Pollet. In Dwight's experience the error by any method is likely to exceed 5 cm. in about one-fourth of the cases.

According to Humphrey, the average measurements of the adult European skeleton, reduced to a scale of 100, are as follows: Spine, 34.15; circumference of skull, 31.54; length of humerus, 19.54; radius, 14.15; hand, 11.23; femur, 27.51; tibia, 22.15; foot, 16.03; transverse pelvic diameter, 8; anteroposterior pelvic diameter, 6.61. These figures are considerably at variance with those of Orfila.

The following table of Dr. Guy's was compiled from his observations on 44 male and 7 female subjects, with full appreciation of the inaccuracies in the work of Sue and Orfila:

Sex.	Stature.	Vertex to pubes.	Pubes to foot.	Upper arm from acromion.	Femur.	Tibia.	Fibula.	Humerus.	Radius.	Ulna.
	Inches.									
Male.....	66.5	33.5	33	29.5	17.7	14.6	14.2	12.4	9.4	10.2
Female...	61	31.1	29	26.7	16.5	13.8	13.4	11.6	8.7	9.8

A great variety of rules have become traditional in regard to the comparative lengths of the body and its various members, all of which are less accurate than the tables of Orfila, Humphrey, and Guy.

When the arm alone is at disposal, the approximate height is said to be obtained by taking twice the length of the arm, adding 10 inches for the two clavicles and 2 inches for the sternum. This method gives roughly the horizontal reach of the subject, which, however, may vary several inches from the height.

When the hand is laid flat upon a table, the thumb-nail is usually

<sup>1</sup> New York Medical Record, 1894, p. 243.



on a line with the web of the middle finger. The length of the middle finger, measured from this line, has long been regarded as  $\frac{1}{15}$  of the height of the body. The length of the forearm from the tip of the olecranon to the tip of the middle finger has likewise long been accepted as measuring  $\frac{5}{15}$  of the height of the body.

In the Tichborne case the question was raised whether Roger, who at twenty-one years of age was slender, 5 feet 9 $\frac{1}{2}$  inches high, and 9 stone in weight, with narrow hips, thin, straight legs, and long, bony fingers, could, after twelve years of active life in Australia, become a huge man like the claimant, Orton. The evident improbability of such a change in stature bore strongly against the impostor. Yet considerable variation in the weight of individuals at different periods of life, especially of women, need not excite surprise. Recovery from an acute infectious disease is frequently followed by increase in weight, while a chronic disease usually reduces the weight. Children often give very early indications of their probable adult stature and weight, but severe rachitis in early life will permanently retard the best development of the bony skeleton. The effects of rachitis on the adult stature are very evident in the poor development of the skeleton and the bowed limbs of the poorer classes of Italians in this country. A very pronounced "pigeon-breast" in a rachitic infant usually leaves demonstrable traces throughout life. The *newborn infant*, weighing on the average about 7 pounds, loses weight rapidly for the first two or three days, to the extent of from 4 to 7 ounces. There is then a uniform gain in weight, so that by the eighth or the ninth day the initial loss has been replaced. At the end of the first year the weight is nearly tripled; it is again doubled by the sixth year, and again about the fourteenth year.

**Sex.**—The sex of the living has seldom any bearing on the question of identity. When separate portions of the recently dead body are recovered there is usually little difficulty in discovering the sex of the individual. When the head only is found, the countenance, skin, and hair will generally suffice to prove the sex. In the trunk, the shape and development of the shoulders and chest will give reliable indications in the absence of the breasts, uterus, or prostate gland, which ordinarily serve for identification. The amount of hair on the skin, the formation of the fingers, toes, and nails, the thickness of subcutaneous fat, and the degree of muscular development are to be considered in the limbs. Rarely is it possible to mistake the limb of a hard-working woman for that of a delicate man.

Between the **skeletons of the male and female** there are pronounced differences, which are especially evident after puberty. In general the bones of the female are lighter, the shafts thinner, the medullary and cancellous spaces relatively wider, than in the male. In consequence of slighter muscular development the bones of the female are less curved, the processes and ridges furnishing points of muscular attachment less prominent, and the joints smaller. The cranial capacity of the average female is about one-tenth less than that of the average male, and the frontal and occipital regions are relatively less capacious.

The mastoid processes, superciliary ridges, zygomatic arches, and frontal sinuses are less prominent in the female. The lower jaw is



FIG. 127.—Male pelvis (slightly less than one-third natural size) (from the *American Text-Book of Obstetrics*).

narrower, the chin less projecting, and the face smaller in proportion to the cranium in the female. The female thorax is relatively shorter and



FIG. 128.—Female pelvis (one-third natural size) (from the *American Text-Book of Obstetrics*).

more rounded than the male, but the spinal column and trunk are relatively longer in the female. In the male the body of the sternum is slightly more than twice the length of the manubrium, while in the

female the whole bone is relatively shorter and the body is usually less than twice the length of the manubrium. The ribs are smaller and the costal cartilages longer in the female. The angle between the neck and shaft of the femur is less obtuse in the female than in the male.

The **pelvis** of the two sexes differs in many particulars. "In the female the height is less, and the breadth and capacity of the true pelvis greater; the ilia are, however, more vertical, and thus the false pelvis is relatively narrower than in the male; the inlet of the true pelvis is more regularly oval, the sacral promontory projecting less into it; the sacrum is flatter and broader; the depth of the symphysis pubis is less; the subpubic arch is much wider and the space between the tuberosities of the ischia greater" (Quain). The accompanying figures illustrate these and other points of difference.

**Occupation.**—As many of the trades require the constant use, in the same manner, of a single instrument, exercising the same muscles, forcing the worker to use the same special senses and to remain long in one posture, it is not strange that many tradesmen carry unmistakable physical evidence of the character of their work. These marks are naturally found in the members most severely taxed, as in the hands of day laborers or the fingers of dressmakers. Here, as with the signs relating to age, corroborative value is often all that can be attributed to the evidence obtainable.<sup>1</sup>

**Clerks** and others constantly occupied in writing frequently have a slight callosity on the tip or ulnar border of the little finger, with a similar thickening of the epidermis where the pen is grasped between the index- and middle fingers; occasionally they suffer from writer's cramp.

**Jewelers** may show slight retraction of the last phalanx of the left thumb. They do not suffer with special frequency from cataract, as was once claimed, but they may be subject to cramps or to spasms of the muscles similar to those of writer's cramp.

**Dressmakers** show a characteristic sign on the left index-finger, where the skin is roughened by the multiple punctures of the needle.

**Shoemakers** suffer frequent cuts from the thread in the skin of the index-finger between the second and third phalanges. The nail of the left thumb is usually thick and hard, and its edge is frequently serrated or broken by the awl. Constant stooping, especially if the trade has been followed from early life, may produce a moderate lordosis with slight concavity of the sternum. The pressure of the last may cause an indentation of the lower end of the sternum. The skin of the exterior surfaces of the thighs is rough, and the hair is usually worn away by friction of the apron. These latter characteristics are not at all peculiar to shoemakers alone.

**Workers in iron, copper, and other metals** usually have various callosities on the hands as a result of continued friction with pieces of

<sup>1</sup> Icard (Jour. Amer. Med. Assoc., 1921, 76, 1693) calls attention to the value of an examination of the cerumen in occupational identification. He finds various dust particles mixed with the cerumen as evidence of occupation.



these metals. Scrapings from the nails and fingers, after incineration and solution in acids, may be found to contain traces of the metals employed.

**Painters**, in not a few instances, present a blue line along the bases of the teeth or along Steno's duct; they may suffer from anemia, constipation, and colic; and less frequently there may be a persistent "wrist-drop." Lead may be recovered from scrapings beneath the nails.

**Washerwomen** and **general domestics** sometimes may be recognized by their swollen, soft fingers and hands, which are usually of bright red color. "Housemaid's knee" and "flat-foot" are common conditions among these people.

**Tanners** usually have broad callous fingers with a deep brownish discoloration, due to the action of tannic acid, the presence of which may be demonstrated by the black stain produced by tannate of iron, formed by treatment of the skin with potassium ferrocyanid.

**Sailors** are usually excessively tanned, while their hands and feet, being frequently soaked in water, may show the results of maceration in the form of inflamed cracks and fissures.

**Laborers'** hands present a uniformly thickened skin with various callosities from contact with the tools employed. The muscles of the arms and shoulders are highly developed, and the arms are frequently carried in a position of partial flexion.

**Bakers** who knead the dough with their hands often have callosities on the terminal knuckles of the fingers.

Moingeard<sup>1</sup> has observed a siderosis of the skin of the left little and ring-fingers in **millstone grinders**, due to small splinters of steel that are driven into the skin, producing marks resembling a tattoo and persisting for years.

**The Hair.**—The examination of the hair has at all times proved to be one of the most important subjects of medicolegal inquiry in connection with the identity of both the living and the dead. Hairs are very resistant to the ordinary processes of decomposition, and therefore may remain as permanent evidence of identity long after other features of the dead or mutilated body have become unrecognizable. Portions of the hair are specially likely to become detached from the head and transferred from one person to another in any violent encounter. In homicides the violence is most frequently applied on the skull, and hairs readily become attached and often fastened by blood to the instrument used. Vegetable fibers from the clothing or the hairs of domestic animals are frequently found on the person of the victim or assailant, and their presence has in many cases furnished very cogent evidence. Further, the most complete transformation in appearance is readily produced by changes in the color, length, and arrangement of the hair, and consequently these are the most frequent means of disguise employed by criminals.

A chief reason why the hair so often furnishes decisive evidence lies

<sup>1</sup> Annales de Hygiene Publique, xxiv, p. 39.



in the positive information as to its origin and character obtained by microscopic examination. When hairs are recovered from a dead body or from its vicinity, they should be carefully inspected and any adherent particles preserved; they should then be washed in water, dried, and mounted in balsam or glycerin for examination.

The hair is an appendage of the skin corresponding anatomically with the epidermis. It consists of a shaft, a root, and a bulbous extremity embedded in the hair-follicle. Microscopically the hair-shaft

consists of an outer cuticular fibrous portion and an inner medullary darker portion. The shaft is crossed by transverse lines, due to the layer of flat cuticular cells that cover its surface. These imbricated scales are more prominent at the root of the hair, where they produce a distinctly serrated edge along the shaft when it is seen in profile. The fibrous portion of the shaft is composed of a very compact mass of fine fibrils. The medulla consists of spheroid cells containing air-bubbles, which, by transmitted light, appear as dark granules. The medullary portion is absent from the very fine hairs of the general body surface, from the colored hairs of the scalp, and from the hair of young children.

The root, with its bulbous extremity, is embedded in the hair-follicle, where the substance of the hair is intimately connected with the epithelial and fibrous elements of the follicle, from which it is developed. The color of the hair is due principally to pigment granules, partly also to diffuse pigment found in the cortex, and to the presence of air-bubbles in the medulla, which alter the effect of the pigment. The natural color of the hair is evenly distributed and extends down into the hair-follicle.

In the **manner of growth** the hair of the scalp may be very fine or coarse, characters retained throughout life; and it may be straight, wavy, or curly, characters which frequently change at different periods of life. The distribution of the hairs of the scalp may be very characteristic: sometimes they are grouped in twos or threes; sometimes they appear singly and uniformly over the scalp. Microscopic examination of the scalp shows that this grouping has an anatomic basis in the connective-tissue capsule surrounding two or more hair-follicles, and that it is, therefore, a permanent characteristic. Blond hair is

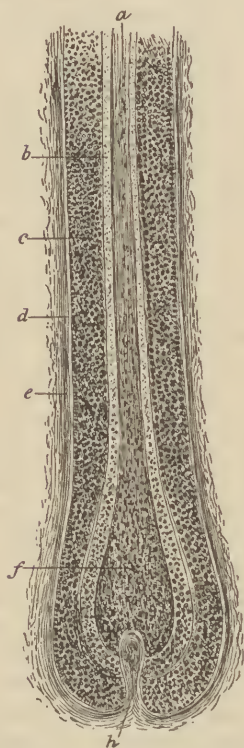


FIG. 129.—Hair-follicle from human scalp: *a*, Hair; *b*, inner root-sheath; *c*, outer root-sheath; *d*, glassy membrane; *e*, fibrous sheath; *f*, hair-bulb; *h*, hair-papilla.

said to be usually more abundant and stiffer than dark hair, a character which is most pronounced with the beard, while the diameter of the dark hair is usually larger. The hair-follicles of the negro scalp may be distinctly curved, and may even point away from the surface of the scalp (Stewart).

The **rate of growth** of the hair of the scalp is about  $\frac{1}{2}$  inch a month, being more vigorous in youth and less active in adult life. It has repeatedly been observed that the hair may grow after death. In the *New York Medical Record*, August 18, 1877, Dr. Caldwell reported that in 1862 he was present at the exhumation of a body that had been buried for four years. The coffin had become loosened at the joints, and the hair of the corpse appeared at these openings. There was reliable evidence that the head had been shaved before burial, yet the hair of the head measured 18 inches in length, the beard 8 inches, and the hair of the chest 4 to 6 inches. The nails have also been found to increase in length after death.

When portions of hair are submitted for examination, it is necessary to determine whether the hair is from the human body, from one of the lower animals, or if it be hair at all or merely vegetable fiber.

**Human hair** may usually be positively distinguished from **that of the lower animals** in having more delicate and numerous cross striations. The size of the hair, the relative width of medulla and cortex, and the location and color of the pigment should also be considered and compared with the specimens taken from different parts of the body, and, if the hair prove to be other than human, with that of different animals.

The long hairs of animals are usually found mixed with a finer, downy, and much more abundant hair, which is not seen in the human body.

The **region of the body** from which the hair has been removed can be determined with considerable accuracy from the length, size, color, stiffness, curliness, and general gross appearance. The medulla is usually absent from downy hairs and may be wanting at some points in the hairs of the scalp. The coarsest human hairs are those from the beard, eyebrow, axilla, and pubes, and are from  $\frac{1}{230}$  to  $\frac{1}{160}$  inch in diameter. Hairs from the nostrils, back of hands, scalp, and the eyelashes vary from  $\frac{1}{660}$  to  $\frac{1}{330}$  inch in diameter. The fine downy hairs are very much smaller, being from  $\frac{1}{3000}$  to  $\frac{1}{1500}$  inch in diameter (Tidy). In women and children the hair is usually finer than in men. The short hair from the nostril and eyelid is circular on section and uniformly curved. The hair that appears at puberty is usually triangular on section, as of the beard; or oval, as of the pubes, but seldom quite circular.

When it is determined that the specimen is not hair, but vegetable fiber, it is important at times to ascertain its exact nature. It is sometimes possible in this way to identify cotton, linen, and other garments.

**Cotton fibers** are characteristic flattened bands, with thickened, refractive borders, and twisted into irregular spirals. The distinctly

structureless appearance of this and other vegetable fibers greatly aids in separating them from material of animal origin.

**Linen fibers** are more solid and rounded than cotton. At short intervals these fibers present irregular transverse joints, and when the fiber is broken, as usually occurs at these joints, the ends are ragged and fibrillated. Linen fibers, when treated with nitric acid, develop an oblique striation, thus differing from **hemp**, of which the fibers are coarser and fail to show striation under the action of nitric acid.

Silk and wool, although of animal origin, are usually examined as shreds of garments, and are, therefore, considered in this connection. **Silk fibers** are very highly refractive solid fibers, free from transverse markings and evidences of cellular structure. Being of a horny nature, they turn red by treatment with Millon's reagent (acid solution of mercuric and mercurous nitrates), in which reaction they differ from cotton and linen, which remain unchanged after this treatment. **Wool** consists of coarse, irregular, flexible, very curling fibers, showing distinctly the cortical cells, and marked by irregular coarse transverse striations. Hairs from **fur** garments, such as seal, otter, sable, and mink skin, should be compared directly with genuine samples of these furs.

**Manner of Extraction.**—It is sometimes important to know whether the hair has fallen out, been torn out, or been cut off. When hair falls out naturally, its root will be found almost as dry as the shaft, and well rounded and smooth. When torn out, the old hairs may closely resemble the fallen ones, but of those that were firmly fastened, the roots will be soft, open, and moist. Attached to the root will be a cellular or fatty layer which belongs to the follicle or the sheath, and which has been torn out along with the shaft. A single hair with rounded atrophic root may have been pulled out, but if a considerable number of hairs can be secured for examination and it be found that they all have rounded atrophic roots, it is safe to conclude that they have all fallen out.

Hair that has been cut off by scissors shows an even cut edge, but when sawn off by successive cuts of a knife the ends are more or less split. In either case they lack the root. The long hairs from the female scalp usually show a splitting of the ends, due to combing.

**Changes in the Color of the Hair.**—Natural changes in the color of the hair may occur very frequently. The hair of children usually grows darker with increasing age. After the loss of hair resulting from infectious diseases, such as typhoid fever, the returning growth may be much darker. Sudden fright and other extreme mental emotions have repeatedly been followed by sudden and pronounced bleaching of the hair. This phenomenon has never been satisfactorily explained, but it has been supposed to result from the development of air between the elongated cells composing the shaft (Schäfer). Premature grayness may occur without known cause, and it has often been ascribed to heredity. Metchnikoff has recently referred the natural bleaching of hair to the action of bacteria. Remarkable differ-



ences in the color of the hair of parents and children are frequently observed, as in the children of albinos.

Artificial changes in the color of the hair may occur accidentally. The hair of ebony turners and workers in indigo may develop a greenish tint, and that of copper smelters may become bluish green (Tidy). In the large majority of cases alterations in the color of the hair are the result of intentional use of dyes.

**Dyeing of Hair.**—Artificial coloring-matter of many varieties may be applied to the hair by means of pomades. Lamp-black is usually selected for application in this way. Its detection is easily accomplished by demonstrating a similar discoloration of the scalp, and by washing the hair in ether, by which the grease is dissolved and its admixture of carbon particles made to float in suspension in the ether.

**To darken the hair** solutions of metallic salts are employed, usually of lead, silver, or bismuth. The natural sulphur of the hair produces the sulphid of these metals, giving various dark shades, even to a jet black. Red hair contains a relatively large amount of sulphur, and readily changes to a deep black. Or the sulphur may be supplied by previously washing the hair in a solution of an alkaline sulphid, preferably potassium sulphid. The presence of a metallic dye may be detected by washing the hair in water weakly acidulated, and treating the water with the ordinary chemical tests for these metals.

**To bleach the hair** the fatty particles should first be removed by washing in an alkaline solution, after which repeated applications of strong chlorin water will cause a distinct whitening within a few hours. Treatment with chlorin renders the hair very brittle, and the odor of chlorin is very tenacious. A golden color is usually produced by the application of peroxid of hydrogen, which oxidizes the natural pigment of the hair, giving a golden-yellow color.

To demonstrate the fact that the color of the hair has been artificially changed it is necessary to determine: (1) A want of uniformity in the color. (2) A growth of normal hair of a different color, to be seen at that portion just emerging from the scalp. (3) Marked differences in the color of the scalp and that of the other portions of the body where the dye has not been used. (4) The presence of the dye in the shaft of the hair in a *diffuse* form and the absence of similarly colored granular pigment. (5) The presence of secondary alterations in the hair, such as the brittleness resulting from chlorin. (6) The presence of a metallic salt or other dye in the washings or ashes of the hair.

The **nails** frequently show traces of the trade followed by the individual, as previously detailed. An interesting study of the changes in the nails due to disease, occupation, etc., may be found in Esbach's monograph.<sup>1</sup>

**The Teeth.**—Peculiarities in the number, formation, and condition of the teeth are among the most reliable aids in identification both of the living and of the dead. Their condition is of specially valuable assistance in the determination of age. The successive appearance of

<sup>1</sup> Modifications de la Phalangette, etc., Paris, 1876.



the teeth of the first and second dentitions is, in the great majority of children, a very uniform process, although in different individuals it



FIG. 130.—Part of the lower jaw of a child three or four years old, showing the relations of the temporary and permanent teeth. The specimen contains all the milk-teeth of the right side, together with the incisors of the left; the inner plate of the jaw has been removed, so as to expose the sacs of all the permanent teeth of the right side, except the eighth or wisdom tooth, which is not yet formed. The large sac near the ramus of the jaw is that of the first permanent molar, and above and behind it is the commencing rudiment of the second molar (Quain's *Anatomy*).

may vary widely. At birth the jaw contains the dental sacs, with the temporary teeth, of which the crowns are already calcified, with the calcified crown of one permanent tooth, the first molar.

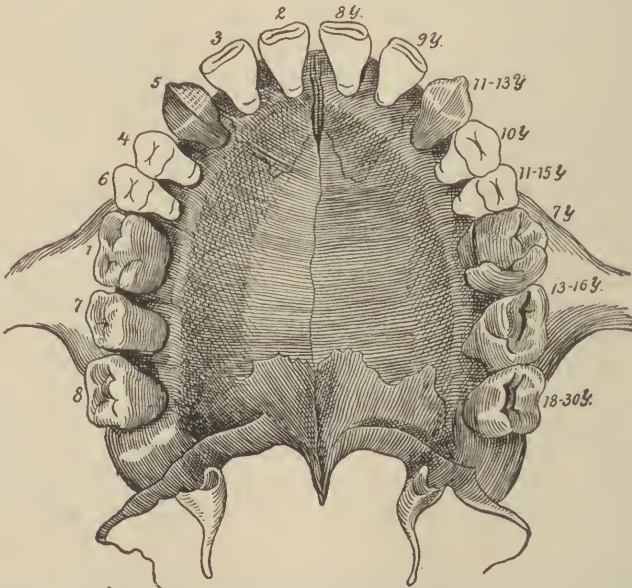


FIG. 131.—Diagram from Welcker, showing on the left side the order, and on the right side the time (in years), of appearance of the permanent teeth of the upper jaw (Raubert).

During the first months of infancy the sacs enlarge and produce rounded swellings in the gums; fangs grow on the teeth, and soon the

sharp, calcified edge of the tooth is thrust through the gum. The first dentition is usually completed in three years.

The usual periods of eruption of the temporary teeth are as follows:

Six to eight months, lower central incisors. Interval of three to six weeks. Eight months, upper central incisors; eight to ten months, upper lateral incisors. Interval of one to three months. Ten to twelve months, lower lateral incisors; twelve to fourteen months, front molars. Interval of two to three months. Eighteen to twenty months, canines; twenty-two to twenty-four months, posterior molars.

Some children are born with the incisors already cut, while others have no teeth until they are two years of age. A curious case of entire failure of dentition is reported in the *Boston Medical Journal*, March 6, 1879: The man was twenty-four years of age, but had never had any teeth. Instances of a third dentition in advanced life are also reported. Rachitis not only delays the development of the teeth but also usually interferes with their proper formation. Congenital syphilis tends to hasten the eruption of the temporary teeth, while the permanent upper central incisors are frequently notched (Hutchinson).

The permanent teeth do not appear with such regularity as the temporary set, and furnish somewhat less reliable indications of age.

The periods of eruption of permanent teeth are:

*Sixth Year.*—Four anterior molars.

*Seventh Year.*—Two middle incisors.

*Eighth Year.*—Two lateral incisors.

*Ninth Year.*—First bicuspids.

*Tenth Year.*—Second bicuspids.

*Eleventh to Twelfth Year.*—Canines.

*Twelfth to Fourteenth Year.*—Second molars.

*After Twenty-first Year.*—Wisdom teeth.

The records which dentists sometimes keep of the condition of their patients' teeth may be found valuable for purposes of identification. A full discussion of the medicolegal relations of the teeth is contributed by Manczka.<sup>1</sup>

**The Skin.**—The character and markings of the skin are of interest to the medical jurist principally in relation to scars and tattoo-marks, which may acquire extreme importance in cases of doubtful identity. In the Tichborne case Sir Roger had had a chronic ulcer on one arm which must have left a scar; he had been bled repeatedly from both arms, ankles, and one temple, and he had been tattooed with India ink. The claimant, however, showed no traces of any of these operations, and himself presented a large brown mark on the side, a distinct scar, probably the effaced letters, A. O., tattooed upon his arm, none of which was known to have existed on the person of Roger Tichborne.

The possible medicolegal bearings of cicatrices require the consideration of the following questions:

1. Does a wound necessarily leave a cicatrix?

<sup>1</sup> Oesterreich-Ungarische Vierteljahresschrift für Zahnheilkunde, viii, H. 3.

2. May a scar, having once existed, be obliterated by time or by artificial means?

3. Can the age of a cicatrix be inferred from its appearance?

4. Can the character of the wound be determined from the appearance of the scar?

5. Can the size of a wound be determined from the scar?

**1. Does a wound necessarily leave a cicatrix?**

It is commonly stated that all wounds involving loss of substance necessarily leave scars. But this very general rule is an inadequate answer to the question in hand, for some wounds involving loss of substance do not leave scars, while others without loss of substance produce permanent cicatrices.

The solution of this question requires the application of the ordinary laws of the repair of tissue after a division of continuity or loss of substance. When there is a loss of substance in an epithelial tissue, either skin or mucous membrane, which does not pass below the level of the epithelium, repair is effected by simple proliferation of epithelial cells, and no cicatrix is formed. When the lesion involves other deeper tissues, subcutaneous connective tissue, fat, etc., the process of repair follows one of three plans: (1) There may be immediate adhesion of the divided surfaces, the healing proceeding by *primary intention*. Here the exudation of fibrin is very slight and merely aids in the cohesion of the surfaces, while the formation of granulation tissue is so inconsiderable that it may be regarded as practically absent. (2) There may be an exudation of fibrin, serum, and leukocytes on the cut surfaces, delaying the adhesion of these surfaces which later unite by *secondary intention*, with the production of *granulation tissue*. (3) There may be an excessive exudation of serum, fibrin, and leukocytes; the surfaces suppurate, they do not adhere at all, and the wound fills up from the bottom with granulation tissue.

*Upon the amount of granulation tissue formed will depend the extent and permanence of the scar*, for this tissue is never entirely replaced, but becomes converted into dense cicatricial connective tissue. Any or all of the foregoing processes may occur in different parts of the same wound, but any wound, the healing of which has not occurred entirely through "primary intention," but has been attended with suppuration or infection, will, in every case, leave an appreciable scar.

As to the exact process that takes place in the union by primary intention, no uniform rule can be stated. The subject is of sufficient importance to warrant the following quotation from Thoma.<sup>1</sup> "Macartney, Thiersch, and others have asserted, in regard to the healing of linear incisions, that in many cases the surfaces may unite so closely that the line of the wound is indistinguishable after a few days, and can at best be recognized only by alterations in the position of the parts. Direct union of the separated parts without the formation of cicatricial tissue is supposed to be possible; but this view has as yet received no conclusive demonstration. A new formation of tissue seems really to

<sup>1</sup> General Pathology, American edition, 1896, p. 484.



be necessary for firm union of the margins of a wound, although it may be very slight in amount. Histologic examination of the incision made in laparotomies shows that this new formation of tissue greatly depends on the general condition of the patient. As can readily be understood, it is only when death occurs by hemorrhage, sepsis, pyemia, or other pathologic condition that the laparotomy wounds can be examined histologically within a few days of operation. In such cases the surfaces of the wound are closely apposed, and its line is hardly visible. Fine strands of lymphoid cells accompanying the vessels are all that is to be seen. It is only in parts where the margins of the wound are slightly apart that some red and white corpuscles, fibrin, and young connective-tissue cells are found. In addition to this, the margins of the wound show more marked infiltration with small cells. If, in such cases, the line of the wound is not visible throughout its length two or three days after operation, this is chiefly due to the close apposition of the parts produced by the sutures, but does not necessarily indicate any direct union. The more closely the margins of the wound are apposed, however, the more delicate will be the scar when healing is completed, and sometimes it really does subsequently become very difficult to see. Any loss of tissue which is converted into a linear wound by close apposition of living tissues covered with epithelium externally heals in a similar manner." It must be granted, therefore, from these considerations, *that it is possible in rare cases for an incised wound, even though associated with loss of substance, to leave no demonstrable permanent cicatrix.*

## 2. A scar having once existed, may it be obliterated by time or by artificial means?

In order to reconcile the contradictory observations on this point it is again necessary to consider the character of the process by which the wound has healed. Caspar has observed the marks of the scarificator to disappear in two or three years. Devergie thinks such marks do not disappear, but may in time become less distinct. There can be no doubt that the marks of the scarificator made in youth are commonly seen in old age, a fact which is emphasized by Tidy. These observations, all of which may be correct, are to be explained only by the differences in the rapidity and completeness of the original healing process, and by the amount of cicatricial tissue then produced. Clean linear incised wounds of which the edges are properly apposed, and in which the healing process occurs without suppuration or excessive exudation, leave thin delicate scars that may gradually disappear. On the other hand, there is no reliable evidence that a cicatrix formed after considerable granulation or suppuration has ever spontaneously disappeared.

The statement of Ogston<sup>1</sup> that he has seen "all traces of several chancres" on the same individual disappear in six weeks has been doubted by some authors, but will excite no great surprise among venereal surgeons who have had much experience with the treatment of superficial chancroids.

<sup>1</sup> Medical Jurisprudence, p. 60.



The prominence of delicate scars left after primary union may be considerably diminished by prolonged treatment with massage. Deforming scars are often excised, but the resulting loss of tissue is almost invariably sufficient to produce an indelible, although less prominent, cicatrix. The distinctness of cicatrices may be temporarily increased by friction of surrounding parts, which causes hyperemia in the normal tissue, while the limited vascular supply of cicatricial tissue presents a corresponding increase in its blood content.

### 3. Can the age of a cicatrix be inferred from its appearance?

With very rapid healing of incised wounds it is stated by Thoma that the incision may be invisible at the end of three days, although firm union has not yet occurred. The appearance of a cicatrix formed after granulation depends upon the changes occurring in granulation tissue during its transformation into cicatricial tissue. At the end of from seventy to ninety hours (Thoma) there are dilatation of the capillaries and increased redness about the edges of a wound healing by secondary intention. This soon leads to the formation of many new capillaries and the organization of the exudate. In ordinary incised wounds the process of healing is usually complete in two weeks, leaving a soft, hyperemic, red cicatrix. The process is more rapid in children than in old persons, in healthy subjects than in those enfeebled by disease, hemorrhage, or sepsis. Wounds of the lower extremities, where venous circulation is less active, sometimes heal more slowly than wounds of the upper extremities. Healing by granulation always requires more time than that by adhesion. When there has been extensive loss of substance, as in lacerated and contused wounds; when the edges are imperfectly approximated or are drawn apart by underlying muscles, by movements of joints, or by the restlessness of the patient; and especially when there have been infection and suppuration in a wound—union proceeds more or less by granulation, and the formation of a cicatrix requires much longer time.

After the cicatrix has completely organized the blood-vessels gradually shrink, the effused blood is disintegrated and removed by the lymphatics, the new connective tissue contracts, and there remains finally a segment of dense fibrous tissue with few cells and few blood-vessels, plainly marked off from the surrounding skin as a permanent cicatrix. It will readily be seen that the external appearances of a cicatrix will vary much at different periods of its organization. A *fresh scar* is soft, tender, may often be broken down by firm pressure, and is reddish-brown in color, due to the pressure of dilated capillaries. At a variable period, usually not before a *month or six weeks*, the blood-vessels and connective tissue begin to contract, the cicatrix becomes firm and takes on a brownish color. After months or years it may have nearly disappeared, and the connective tissue is contracted, leaving a white, glistening, hard, insensitive scar.

### 4. Can the nature of a wound be determined from the character of the scar?

Much may be inferred, and some positive conclusions may be drawn

as to the mode of origin of a wound by an examination of scars, as many cicatrices are quite characteristic.

*Accidental wounds produced by crushing force* and attended with laceration and destruction of tissue give large irregular depressed scars, and there may also be signs of old fractures of underlying bones.

*Bullet wounds*, when produced by a weapon held within a few inches of the body, produce scars that are larger than the bullet, irregular in shape, and usually surrounded by indelible powder-stains. When a bullet wound has been produced from a distance, the scar is depressed, discoidal, and smaller than the bullet. In either case the scar at the point of exit of the bullet, from flesh as from bone, is larger than the scar at entrance.

*Stab wounds* leave triangular scars, smaller than the blade, and less depressed than the scars from bullet wounds.

*Burns*, when of sufficient intensity to cause death of tissue below the epidermis, are followed by irregular, flat, smooth cicatrices, corresponding in size to the original lesion. The extent of these cicatrices is frequently considerable, and the contraction of the new connective tissue may cause marked deformities. The cicatrices of burns, rather more frequently than those of other wounds, may undergo a progressive hypertrophy, with the production of a thick, firm mass of connective tissue, with atrophic blood-vessels and dilated lymphatics, known as *keloid*.

*Surgical wounds* usually result in clear linear cicatrices, but suppuration, extensive removal of tissue, and prolonged use of drainage-tubes may alter their appearance. The marks of *wet cups* frequently persist throughout life as one or two rows of six small triangular white scars. *Venesection* is usually performed on the median cephalic vein and leaves a linear cicatrix lying obliquely across the course of the vessel above the elbow. *Vaccination scars* may be found on the upper arm or calf of the leg as flat circular cicatrices, often showing depressions on the surface.

*Scars from Diseases of the Skin.*—Tuberculosis of lymph-nodes or bones frequently produces sinuses leading from the affected tissue to the surface. When these lesions heal spontaneously, the sinuses are replaced by contracting connective tissue, which leaves an irregular superficial scar, usually much depressed and comparatively immovable with the skin. Secondary *syphilis* of the skin may produce characteristic and permanent superficial white scars on the back of the neck, as well as many less characteristic brown plaques in other regions, especially on the shins. The cutaneous lesion of tertiary syphilis, arising from the gumma which destroys considerable tissue, leaves a large, irregular, frequently pigmented, depressed cicatrix. *Small-pox pustules* are followed by small, distinctly depressed cicatrices, the size, location, and general appearance of which are usually characteristic. Transverse superficial cicatrices of the lower abdominal wall are rarely missed after pregnancy, but may be seen also in very fat men.

##### 5. Can the size of the original wound be determined from the scar?

The principle already stated with regard to the contraction of

cicatricial tissue permits the general rule to be given that a scar is always smaller than the original wound. This contraction will be greatest in the long diameter of the areas of new connective tissue, whether these areas are superficial, as after burns, or extend irregularly among muscles and viscera, as after the healing of deep sinuses. The contraction will also increase, up to a certain limit, with the age of the cicatrix. Exceptions to these rules are seen in the case of some wounds inflicted in childhood. Vaccination scars, linear operation wounds, nevi and the scars resulting from their removal, have all been observed in children to increase in size with the natural growth of the body.

Finally, in judging of the value of the evidence furnished by scars, it is essential to recognize the fact, frequently ignored, that *one or more scars, identical in appearance and location, are often to be found on different individuals*, and that the presence of these marks can seldom be considered a positive proof of identity.

**Tattoo-marks.**—Some famous instances are recorded in the older annals in which the presence of a tattoo served as a means of identification. The medicolegal importance of these markings has certainly not decreased at the present time, but is perhaps greater than ever, for this curious and rather inexplicable custom remains a very common one among many classes of society. Sailors, soldiers, and miners furnish a large proportion of the cases commonly seen in America. Criminals, with the exception of the more intelligent class of swindlers and forgers, frequently indulge the taste. Lombroso devotes considerable attention to the subject of tattooing, and it has come to be recognized as a nearly constant feature of criminal anthropology. Lombroso<sup>1</sup> and Marandon de Montyel<sup>2</sup> found that of 600 insane persons, 13 per cent. were tattooed, the frequency with which the marks were found being in inverse ratio to the grade of degeneracy. No case was seen in a patient with advanced psychic degeneration. So much more frequently were the aggressive and dangerous lunatics tattooed that Lombroso believes the presence of these marks might be made of diagnostic value between the dangerous and the comparatively harmless lunatics and criminals.

Women rarely allow themselves to be tattooed, except prostitutes, who frequently cover themselves with various designs, usually obscene.

The process of tattooing varies considerably with the operator, but consists essentially in making multiple needle punctures in the skin and carrying into these minute wounds particles of coloring-matter. Very naturally, from the necessary lack of asepsis, bacteria are often carried in with the coloring-matter, which is itself an irritant, and considerable inflammation usually results; the neighboring lymph-nodes are frequently inflamed and may receive a permanent deposit of pigment, demonstrable after death, and fatal general septicemia has occurred. From Blockley Hospital, Philadelphia, comes the report of the inoculation of nearly a score of persons with syphilis, by the same tattooer, who moistened the needle in his mouth while suffering from secondary lesions of the buccal mucous membrane.

<sup>1</sup> L'uomo delinquente.

<sup>2</sup> Archives d'Anthropologies criminelles, 1892, p. 373.



The coloring-matter may be deposited in the epidermis, or deep in the *rete mucosum*, or in the subcutaneous connective tissue, in which latter case the resulting inflammation, by the production of connective tissue, insures the permanence of the stain. Of the many pigments employed in the process the red colors are usually vermilion (cinnabar), and the blue colors are indigo, cobalt, or Prussian blue, although any colored ink may be used. The ordinary black dye consists of carbon particles used in the form of India-ink. Nitrate of silver also is sometimes employed. Accidental scars resembling tattoo-marks are frequently produced by wounds resulting from explosions, as when coal-dust, gunpowder, printer's ink, soot, splinters of steel, or other insoluble colored particles are carried into the skin.

The *permanence of tattoo-marks* depends upon the efficiency of the operation and the quality of the dye employed. When the pigment is deposited merely in the epidermis, it is gradually thrown off with the outward growth and exfoliation of the layers of epithelial cells. When the dye is passed into the connective tissue of the derma, the resulting inflammation causes an encystment of the particles, and, except for the few grains that may be carried off by the vessels, it becomes impossible to remove them except by first removing the epidermis and then the connective tissue surrounding the dye. Such a destruction of tissue may readily result from the application of caustics, but in every case a scar must remain.

Considerable difference has been demonstrated in the permanence of the different dyes employed. Tidy<sup>1</sup> found that in 121 cases of vermilion tattoo there were evidences of fading in 16, while in 156 cases in which some variety of carbonaceous matter had been used he was unable in a single instance to discover any indication that the mark had faded since the operation. In this author's experience nitrate of silver has also proved absolutely indelible. Vermilion, indigo, and Prussian blue are generally found to fade perceptibly in time. Common inks are more permanent and insoluble, while carbonaceous particles are entirely insoluble and most permanent.

Tattoo-marks may disappear spontaneously, as demonstrated by the observations of Caspar, Hutin, and Tardieu. Caspar<sup>2</sup> found that in 4 of 37 cases the marks had entirely disappeared. Hutin<sup>3</sup> reports that of 509 cases examined at periods between thirty and sixty years, in 47 there was not a trace of the marks. Tardieu has observed the total disappearance of 2 vermilion marks in thirty years, and of 2 India-ink marks in forty-five and sixty years respectively, out of 76 cases studied. In many others of the preceding cases the marks had perceptibly faded.

*Tattoo-marks may be removed artificially.* The extent to which this removal is possible depends, as stated, principally on the depth to which the coloring-matter has been carried. Since the dyes are practically insoluble, the tissue in which the particles are embedded must also be

<sup>1</sup> Legal Medicine, i, p. 191.

<sup>2</sup> Forensic Medicine, i, p. 106.

<sup>3</sup> Recherches sur les tatouages.



removed at the same time. Blisters, escharotics, and the knife suggest themselves as the most natural means of effecting this removal of tissue. According to Tardieu, blisters are often successfully used by French criminals to remove superficial tattoo-marks. He describes the method by which a criminal entirely removed a tattoo-mark in India ink in six days. The skin was first macerated in a paste of lard and acetic acid, then thoroughly rubbed with potash, and finally with dilute hydrochloric acid. By repeating this process, successive crusts were formed, until the level of the dye was reached. While it is possible that the accompanying exudative inflammation might have extruded some of the particles from the *rete mucosum*, Tardieu's claim that no trace of the operation remained can be accepted only on the supposition that the dye was superficially located. Confluent smallpox has been known to obliterate tattoo-marks in children,<sup>1</sup> and it seems probable that severe eczema or psoriasis might also obscure superficial markings.

**Finger-prints.**—It has been thoroughly demonstrated that the minute anatomy of the skin of the finger-tips, where the fine lines and



FIG. 132.—Finger-prints from one hand, showing five distinct patterns.

ridges of the epidermis are highly developed, is of very permanent structure, and has for years been suggested as a reliable means of identification.<sup>2</sup> The position of these ridges is determined by the presence of the papillæ of fibro-elastic tissue, which are an invariable element in the structure of the derma. Over the general body surface the papillæ and their corresponding ridges are very low, but at the tips of the fingers they reach a height of 0.25 mm. ( $\frac{1}{160}$  inch), and form a network of elevated lines of sufficient height to produce definite impressions when the finger, after being moistened or greased, is pressed firmly against smooth paper or glass. So varied and characteristic are the patterns on which the ridges are constructed, and so unalterable, as it appears, do these patterns remain throughout life, that their importance as a means of

<sup>1</sup> British Medical Journal, 1871, ii, p. 532.

<sup>2</sup> Locard, of the Lyons (France) laboratory of identification, has recently added the study of the pores of the skin to our methods of identification. This is called "poroscopy" and is based on the theory that the number, form, and position of the body pores remain the same throughout life.

identification has been generally recognized, and extensive treatises have been devoted to their study.<sup>1</sup>

The first important consideration of the finger-prints appeared in the Latin thesis of Purkinje,<sup>2</sup> who described nine standard patterns upon which the ridges are arranged. Isolated references to the subject then appeared from time to time without attracting special attention. In 1880 appeared the interesting study of Fauld.<sup>3</sup> At the same time Tabor, a San Francisco photographer, proposed a method based on finger-prints for the registration of Chinese. Meanwhile Sir William Herschel had been experimenting with finger-prints as a means of identifying the illiterate Indian coolies, and in 1877 he adopted their use extensively in the government offices of Bengal.<sup>4</sup> From 1888 to 1891 Galton, of London, published four papers on finger-prints and their value as a means of identification, and in 1892 his complete treatise appeared.

Galton divides the patterns into nine classes, which, however, are not exhaustive. These divisions are based upon variations in the curved lines and whorls which usually occupy the center of the thumb, and of transverse and oblique lines which inclose this central whorl. Their minute analysis is an interesting study, but not essential for the ready detection of likenesses and differences. From the observations collected by Galton it appears to be demonstrated that almost absolute confidence may be placed in the permanency of these designs, a conclusion that seems justified from the anatomic basis on which the designs depend. Of 700 cases compared at different periods, but a single instance was noted in which any variation was discovered, that being the union, in the course of years, of a ridge that had been cleft in early life. The radii of the curved ridges necessarily vary with the state of nutrition of the individual and the amount of adipose tissue in the ball of the finger. Variations in the separate ridges, also, must be regarded as a possible result of the natural growth and expansion of the member. Linear or transverse division of ridges is produced sometimes by the scars of minute wounds or fissures, and they are most frequently seen at the very tips of the thumbs. But that any fundamental alteration in the direction of curves or in the origin of systems should occur, either as the result of years of growth or of disease, seems incompatible with the histologic structure of the skin. Galton noticed very marked similarity in the finger-prints of members of the same family, especially in twins. He was unable to discover any uniform racial characteristic.

Very accurate impressions may be obtained by rubbing the thumb in lamp-black and pressing it firmly against a sheet of well-glazed paper. So perfectly are impressions received under suitable circumstances that criminals have been identified by means of these imprints upon paper or glass articles which they have handled with moist, greasy

<sup>1</sup> See Galton, *Finger-prints*, London, 1892.

<sup>2</sup> Breslau, 1823, partly translated by Galton.

<sup>3</sup> *Nature*, xxii, p. 605.

<sup>4</sup> *Ibid.*, xxiii, p. 23.

fingers. In collecting evidence from the scene of a crime it is important to examine papers, clothes, articles of glass, and the polished surface of furniture for the imprints of fingers. On paper, the impression may be developed by pouring over dilute ink, which is less readily absorbed along the greasy lines. Forgeot has used these productions for photographing the impressions. Glass may be exposed to the fumes of hydrofluoric acid, as recommended by Forgeot, which will etch out the pattern along the lines not protected by oily matter. When polished surfaces of metal or wood have received the slightest impress of the finger-tip, the imprint may be developed with considerable distinctness by breathing gently upon them, when the moisture of the breath condenses upon the lines unprotected by the oil of the skin. These impressions, even when almost invisible, become by this simple expedient quite distinct, especially upon black metallic surfaces.

The registration of finger-prints is now a feature of several systems of identification and seems capable of much wider application than it has yet received.

Galton's conclusions on the value of finger-prints as evidence of identity are as follows: "On the average no great reliance can be placed on a general resemblance in the appearance of two finger-prints as a proof that they were made by the same finger, although the obvious disagreement of two prints is conclusive evidence that they were made by different fingers. When we proceed to a much more careful comparison and collate successively the numerous minutiae, the fact remains that a complete or nearly complete accordance between two prints of a single finger, and vastly more so between the prints of two or more fingers, affords evidence, requiring no corroboration, that the persons from whom they were made are the same. Let it also be remembered that this evidence is applicable not only to adults, but can establish the identity of the same person at any stage of his life between babyhood and old age, and for some time after his death."

**Foot-prints.**—The human foot presents such a variety of peculiarities in size, in form, as determined by the efficiency of ligaments, in the shape of different bones, and in the character of the skin, that evidence relating to these members, usually foot-prints in soft earth or snow, may be decisive proof of identity.

The old discussion as to the comparative size of foot and foot-print was maintained by Mascar and Caussé, the former holding that the print is usually smaller than the foot; the latter, that it is usually larger than the foot. The experiments of Tidy<sup>1</sup> may be accepted as demonstrating that the relation of the size of the print to that of the foot is not constant, but depends upon a number of factors.

1. *The Material upon which the Print is Made.*—When the material is composed of freely movable particles, such as sand, the mark is usually smaller than the foot. In moist sand a print may quickly be contracted by the settling of the soil. In clay or other material not composed of freely movable particles the print is always larger than the

<sup>1</sup> Legal Medicine, i, p. 176.



foot. "This appears to be due to the circumstance that in walking the foot is invariably lifted from the ground in the opposite direction from that in which it was placed upon it."

2. Tidy believes that a boot of which the *edge is beveled* has a tendency to make the print smaller, while one of which the edges slope outward tends to make a print larger than the boot.

3. The size of the imprint will vary with the *rapidity of progression*. Both Ogston and Tidy have demonstrated that the foot-print of a person running is smaller than that of the same person walking, which, in turn, is smaller than that produced when standing. In going up hill the imprint of the ball of the foot is more prominent, while in descending, the heel will be the more prominent.

There are numerous *individual peculiarities* in foot-prints. It is an almost invariable rule that men can be recognized at a distance by peculiarities of gait and carriage. Many of these peculiarities consist in sliding and twisting movements which communicate recognizable characters to the foot-print. A good illustration of this fact is seen in the shuffling gait of sailors. The tracks of negroes may be identified by the marked tendency in this race to walk with the feet pointing widely apart.

If foot-prints are made with the naked foot, by careful scrutiny much additional evidence may often be gained. Scars on the bottom of the foot have been recognized by irregularity in the outline of the print. Wounds of definite portions of the foot have been located by blood-stains found at corresponding points of the foot-print. Similar stains have been found in the bottom of the shoes worn after injury. Hyper-trophies or bunions of the inner metatarsal bones may leave distinct traces. The characteristic mark of the *flat-foot* is bounded by nearly straight diverging side lines, and is continuous from the heel to the ball. When the plantar arch is high, the mark of the ball may be entirely separate from that of the heel.

It is sometimes desirable to take casts of foot-prints to be offered as evidence in court. This may be done, as suggested by Hougolin, by heating the surface with a pan of hot coals or by a hot iron, and scattering over the hot surface powdered stearic acid or paraffin. When the melted paraffin has solidified, plaster casts may be made from the model. Molds of foot-prints in snow may be taken in thin gelatin, cooled until about ready to solidify, and a plaster cast made from this model.

**Handwriting.**—Not infrequently it becomes necessary to compare specimens of handwriting in establishing identity. A rather famous case is that of Captain Dreyfus, who was convicted of treason and sentenced to life imprisonment for divulging the plans of defense of the French army. Perhaps the most important question in the evidence there presented was the identity of certain specimens of handwriting in the letters which conveyed the information to the Prussians. Very marked peculiarities of style may readily suffice for identification, but when two specimens show marked differences, either accidental or intentional, it



may require close study to prove the identity of the writers. It may be said of intentional alterations of style that they can seldom be successfully maintained for any length of time, especially if the subject be required to write rapidly. In such cases the inclination of the letters, the formation of capitals, the joining or separation of letters, the formation of small letters, especially r, s, e, c, and f, and occasionally the orthography, are compared. By a careful summary of the evidence thus obtained a correct opinion will usually be reached. It is important to remember in this connection that surprising transformations in the character of the handwriting may result from training in penmanship. Young persons very frequently have an awkward and ill-formed style until some occupation arises which compels them to write long and rapidly, when their style becomes settled and characteristic. Diseases of the joints of the hand, such as rheumatism or rheumatoid arthritis, necessarily alter the character and freedom of the handwriting. Various nervous diseases, especially those attended with tremor, produce more or less irregularity in the formation of letters. The handwriting of the general parietic is characteristic and may be one of the earliest, as it is one of the very sure, diagnostic signs of the disease.

During the past few years the identification of handwriting has developed into a complex science to which a considerable class of experts are now devoted.<sup>1</sup> The exact value which the courts will place upon such identification has not yet been determined, and in the Molineux case the initial verdict was set aside as being based too largely on the testimony of experts in handwriting.

The determination of mental characteristics by means of the handwriting is a somewhat fanciful application of the study of style in penmanship, yet in the hands of experts surprisingly accurate inferences are often made regarding age, sex, and general character.

The handwriting test may be made an effectual means of ascertaining whether a person is right or left handed, a question that has arisen in connection with doubtful identity. The inference whether a given specimen has been written by the right or left hand is rarely possible, although the writing of many left-handed persons inclines to the right.

**Photographs.**—It is generally claimed that the value of photographs as a means of identification is slight. While front and profile views are secured in the Bertillon system of identification of criminals, their importance, in so far as they show facial expression, is regarded by the French authorities as secondary. Yet in many cases, by showing positive likeness, they may furnish valuable corroborative evidence of identity. As negative evidence they are untrustworthy, for criminals frequently transform their facial expression completely, and photographers can readily alter negatives so as to change the character of the print entirely. Yet in the case of the Bryant estate, previously cited,

<sup>1</sup> Dr. Edmond Locard, head of the Lyons (France) laboratory of identification, has recently originated a method of study of handwriting, which he styles "graphometry." This consists, primarily, in the theory that handwriting always shows a certain relation in size between letters and unmistakable characteristics in form, particularly of loops.

decisive importance was attached to the fact that one of the claimants presented an old photograph that resembled those found in the trunk of the decedent. The opinion of the court in this case runs as follows: "Where claimants to an estate of a person whose identity is in dispute introduce in evidence a photograph of their kinsman whose identity with the deceased they are attempting to establish by a comparison of the photograph offered, and two photographs found in the trunk of the deceased, and where comparison shows a marked resemblance, it is strong evidence that they are photographs of the same person; especially when the kinsman of claimants had the same name, same age, same birthplace, and same occupation as the deceased."

It cannot be doubted that the general characteristics of the face may be very accurately judged from front and profile photographs, especially with regard to the length and breadth of the head, the shape of the nose, and the characteristics of the eyes, eyebrows, orbits, and lips.

**General Likeness.**—The evidential value of similarity in appearance, especially in facial expression, has often been demonstrated in trials turning on the identity of individuals. A positive resemblance in appearance has always been considered as strong corroborative evidence of identity, but the absence of such resemblance has frequently been shown to be valueless as proof of non-identity. The burglar, Charles Peace, who was executed for the murder of William Dyson (1879), is described as having so remarkable a power of changing his features and altering his expression that he was accustomed to face detectives who not only knew him well but were actually seeking to arrest him at the time he was talking to them, and was, moreover, able to deceive his wife and son as to his identity (Tidy). In the Tichborne case the great dissimilarity between Orton and Roger Tichborne, and the evident resemblance of Orton to the father of Arthur Orton, carried much weight in the final proof of the real identity of the impostor. Numerous cases of illegitimacy have remained undetermined until the child grew large enough to show unmistakable resemblance to the parent. Individuals vary greatly in their power of recognizing likeness in facial expression. This power is undoubtedly capable of high development, as with detectives who are constantly on the lookout for criminals; and being based upon one of the most tenacious of sensory impressions, that of sight, it becomes with them a nearly infallible means of recognition.

In attempting to establish the presence or absence of general likeness it is important to remember that great alterations may result from years of hardship or even from temporary exhaustion, and that disease or dissipation may completely transform the features in a few months. The following case from the commentaries of Zacchias has been frequently chosen to illustrate this point: "Cassali, a nobleman of Bologna, left his country in youth and was supposed to have perished in battle. He returned after an absence of thirty years and claimed the property appropriated by his relatives. He was so changed in appearance, however, that none of his friends would recognize him, and he was imprisoned as an impostor. Although there were some distin-

guishing marks upon his body, the judges were in doubt as to the identity, and consulted Zacchias to know if the countenance could be so changed as to render it unrecognizable. Zacchias assigned several causes for the transformation, such as age, change of climate, manner of life, and disease, all of which he claimed might produce such alterations, and the judges decided in favor of Cassali."

An interesting question forming the pivotal point in some trials has been *the length of time and intensity of light necessary for the recognition of faces*. The following case will serve for illustration: A lady, on her passage home from India, was awakened one dark night by some one moving about in her cabin. A sudden flash of lightning enabled her to see a man bending over one of her trunks, and his features appeared so distinct that she was able next day to recognize him. The stolen articles were found upon him and he acknowledged the theft.<sup>1</sup>

Tidy believes that a flash of lightning is in many cases, but by no means in all, sufficient for identification. He was able, on one occasion, to detect a pin on the ground by a flash of lightning and to pick it up at the next flash. The great inequality in the duration of lightning flashes is a matter of common remark, nor can any one doubt that faces may be distinctly recognized during some of the more prolonged flashes.

Full recognition has often been made by the light from the discharge of firearms, but the possibility of such identification was not accepted without repeated experiments called forth by the following case, taken from the *Causes Célèbres*, and widely quoted. The Sieur Labbé, on a dark night in May, 1808, was riding with the widow Beaujean, attended by a servant on foot. The servant was wounded by a gun fired through a hedge which was bordered by a ditch. Both swore they recognized the assassin by the light of the discharge. The prisoner, being sentenced to death on this evidence, appealed to the Court of Cassation, and many experiments were made by Guineau, Dupuis, Caussin, and others, which seemed to disprove the possibility of recognition under such circumstances. The light was so transient that it was scarcely possible to see distinctly the form of the head, and that of the face could not be recognized. The sentence was reversed, but Foderé afterward contested this decision, and a subsequent case, confirmed by the experiments of Desgranges, of Lyons, showed the possibility of such recognition.

Tidy refers to 3 other similar cases in the English annals, and concludes from the reported experiments, including his own, that: "Given a moderate distance, a dark night, and the absence of any artificial light, and that the smoke produced by the explosion is not great, recognition is possible in the majority of cases. Given the reverse of these conditions, a considerable distance, a weak flash, and much smoke, and we believe the chances of identification would be doubtful."

**Peculiarities of Special Senses.**—It is necessary to refer only briefly to some common peculiarities of vision and hearing, and to point

<sup>1</sup> Montgomery, *Cyclopedia of Practical Medicine*.



out that they have occasionally furnished important evidence in relation to identity. The examination of the eyes may disclose errors of refraction or motility, and it may transpire that the existing imperfections of vision would prevent the witness from seeing objects claimed to have been recognized. *Daltonism*, or color-blindness, either partial or complete, is a very common affection, and its existence is unsuspected. Before corporations had begun to institute careful examination of the color sense in their employees railroad accidents were occasionally attributed to this natural defect of vision in switchmen, engineers, and other operators. The configuration of the eyes and eyebrows and the color of the iris form important details in the Bertillon system of registration of criminals.

The limits of hearing have at times been discussed in connection with questions of identity, and natural or acquired defects in this sense may have important bearings.

**Peculiarities of speech** are so common and varied that hardly any one fails to identify well-known friends by the sound of the voice. Lisps, stuttering, and nasal or shrill intonation have all been offered as evidence of identity in legal procedures. Stammering is usually a permanent defect, while lisping may often be improved by section of the median raphe that binds down the tip of the tongue. Cardozo<sup>1</sup> refers to "logical but somewhat startling rule," announced by a decision in New York, that the identity of a dog may be shown by the peculiarity of its bark. The instances in current legal records of identification by the sound of the voice are rather numerous.

## THE SYSTEMATIC REGISTRATION OF CRIMINALS

While in the majority of cases requiring proof of the identity of criminals the comparison of the results of physical examination with the less definite data derived from the statements of witnesses is necessary, the increasing use of systems of registration, especially that of Bertillon, must tend to make identification of criminals a process of almost mathematic certainty.<sup>2</sup>

The **Bertillon system** is based upon four chief measurements: (1) Head length; (2) head breadth; (3) middle-finger length; (4) foot length. These measurements are believed to remain constant during adult life. Each of these dimensions is subdivided into 3 classes, small, medium, large, and the resulting 81 classes are filed away as primary headings for reference. Each of these primary headings is again subdivided, according to other measurements, such as the height, the span, the cubit, the height of the bust, and the length and breadth of the ear. The nose is described according to its profile. The bridge may be concave, rectilinear, or convex. The direction of the *alæ nasi*, with reference to the perpendicular of the profile, may be ascending, horizontal, or descending. The classification of ears is determined by the character of the outer border, the profile of the antitragus, the

<sup>1</sup> Hamilton, *Legal Medicine*, i, p. 225.

<sup>2</sup> See section on "Identification of the Living" by Bertillon, p. 63.



contour of the lobe, and the adherence of the lobe to the cheek. The color of the eyes is made the basis of 7 classes. The final result is that a total of 12 headings is secured, of which 11 are subdivided into 3 classes each, and 1 into 7 classes. Thus there are  $3^{11} \times 7$ , or more than a million possible combinations. Of course, the addition of one other measurement, subdivided in 3 classes, would triple the total number of combinations, and Bertillon claims that the system may readily be extended indefinitely. The presence of peculiar marks upon the body is also detailed; and the measurements of the head, nose, and ears are supplemented by front and profile photographs.

The application of the Bertillon system was begun in 1883 and very soon proved its great efficiency. The prisoners sentenced in the courts of Paris to more than a few days' imprisonment are sent to the Bertillon depot daily, and measurements taken and catalogued. These files are forwarded to Lyons and Marseilles, where similar systems are in operation, and it is thus rendered possible to identify in a few minutes an old offender who has previously served a term in a French prison. In 1890, 562 prisoners who gave false names were identified by this system, while only 4 others, who escaped recognition by this method, were by other means discovered to have been previously convicted.

There are, however, a number of limitations to the Bertillon system. The amount of labor required to measure a large number of convicts necessitates the employment of a large force of men, and inaccuracies creep into the records. The system is applicable only to the adult, in which age alone the measurements are known to be constant, for in the large class of youthful criminals natural growth rapidly alters the length of limbs and occasionally the character of features. The effects of disease, accident, and change in nutrition must also be regarded.

Such considerations led Drs. Greenleaf and Smart, of the United States Army, to discuss the anthropometric system, and to devise a method of registration in which the presence of indelible body marks, scars, tattoos, birthmarks, and moles was made the basis of identification. Some such system was necessitated by the fact that desertions from the United States Army were found greatly to exceed deserters, owing to repetition of the offense by the same person. Drs. Greenleaf and Smart believed that if all the body marks of deserters were recorded and the marks of recruits were compared with the records, it would be possible to detect repeaters. A reasonable correspondence in height, age, and hair was thought to be an important requisite in the identification. This method, therefore, makes the permanent body marks of chief importance, which were only secondarily considered in the Bertillon system, while exact anthropometric measurements were discarded, 1 inch above or below the recorded height being allowed for variation or defective measurement. A card is employed for each man, stamped with outline figures of the anterior and posterior body surfaces, and divided by dotted lines into smaller regions. These cards, on which is indicated the location of all permanent body marks, are filed at the Surgeon-general's office. For the comparison of recruits and deserters

a registry in two volumes is made, one for light-eyed and one for dark-eyed men. Each is subdivided into groups of pages, according to the height of persons entered, and each page is ruled in columns for body regions. Tattooed and non-tattooed men of similar height and eyes are entered on opposite pages. On the register, S., T., B., M. are used as abbreviations for scar, tattoo, birthmark, and mole.

This register was inaugurated in 1891 and has proved very effectual. Such a method avoids the confusion likely to result from errors or natural variations in measurements, is applicable to all ages, and is possibly less cumbersome, but lacks the accuracy and detail of the Bertillon system.

Galton, who discusses both these systems at length, pointing out their advantages and defects, very urgently recommends the adoption of finger-prints in addition to the methods of identification now in use. His remarks are well worth consideration:

"There are almost always moles or birthmarks serving for identification on the body of every one, and a record of these is, as noted, an important though subsidiary part of the Bertillon system. Body marks are noted in the English registers of criminals, and it is curious how large a proportion of these men are tattooed and scarred. How far these body marks admit of being usefully charted on the American plan it is difficult to say, the success of the method being largely dependent on the care with which they are recorded. As observations of this class require the person to be undressed, they are unsuitable for popular purposes of identification, but the marks have the merit of serving to identify at all ages, which the measurements of the limbs have not.

"It seems strange that no register of this kind, so far as I know, takes account of the teeth. If a man, on being first registered, is deficient in certain teeth, they are sure to be absent when he is examined on a future occasion. He may and probably will in the meantime have lost others, but the fact of his being without specified teeth on the first occasion excludes the possibility of his being afterward mistaken for a man who still possesses them.

"Now finger patterns have been shown to be so independent of other conditions that they cannot be notably, if at all, correlated with the body measurements or with any other feature, not the slightest trace of any relation between them having yet been found. For instance, it would be totally impossible to fail to distinguish between the finger-prints of twins who, in other respects, appeared exactly alike. Finger-prints may, therefore, be treated without the fear of any sensible error, as varying quite independently of the measures and records in the Bertillon system. Their inclusion would, therefore, increase its power fully 500 fold. . . .

"When the data concerning a suspected person are discovered to bear a general likeness to one of those already on the register, and a minute comparison shows their finger-prints to agree in all or nearly all particulars, the evidence thereby afforded that they were made by the same person far transcends in trustworthiness any other evidence that

can ordinarily be obtained, and vastly exceeds all that can be derived from any number of ordinary anthropometric data. By itself it is amply sufficient to convict. 'Bertillonage' can rarely supply more than grounds for very strong suspicion; the method of finger-prints affords certainty. It is easy to understand, however, that so long as the peculiarities of finger-prints are not generally understood, a jurymen would be cautious in accepting their evidence, but it is to be hoped that attention will now become drawn to their marvelous virtues, and that after their value shall have been established in a few conspicuous cases it will come to be popularly recognized."

These considerations are very reasonable criticisms of the system of criminal registration now in use, and they point out, it would seem, the lines upon which these systems must be developed and perfected if, as is extremely desirable, they are to receive universal adoption.

### IDENTIFICATION OF MUTILATED REMAINS

The discussion of identity has thus far concerned only the living person or the entire dead body. When only a portion of the body or a few bones have been recovered, the problem of identification becomes greatly complicated and its solution often impossible. Much depends upon the acuteness of those persons who discover such fragments, for the situation and surroundings of the remains often give a decisive clue to their identity and one that it is entirely impossible to obtain from an examination of the remains alone. The locality in which the portions of the body are found should be thoroughly searched for other fragments, for articles of clothing, jewelry, or any material with which the remains were covered, for weapons or instruments used by the assailant, for foot-prints, finger-prints, hair, etc.; in fact, every peculiarity of the situation should be carefully noted, numerous instances being recorded that show the extreme importance of these minutiae. The final identification of Dr. Parkman was effected by the discovery of 35 pieces of bone in the ashes of a stove, which proved the absence of teeth from the lower jaw. Artificial teeth were also found in the ashes and were identified by the dentist as the ones he had recently made to replace the lost teeth. In the recent discovery of the murders attributed to Hermanns, of Salt Lake City, the teeth and jewelry of one victim were found in the ashes of a stove, a portion of the corpse under a stone floor, while the blood-stained overalls of the murderer were hidden away in another portion of the building. In some of the Whitechapel murders the remains of the victims were found scattered at widely distant points.

When such portions of a body or skeleton are recovered it becomes important to determine, first, whether or not they are human remains. The presence of a small portion of skin may at once decide the question, and the careful examination of an entire bone will usually be equally conclusive. When, however, smaller fragments of bone or flesh are recovered it is seldom possible, by either gross or microscopic examina-



tion, to determine whether the fragments are of human or animal origin, unless they are specially characteristic. The remains proving human, the question whether they belong to the same body may be determined by comparison of the skin, the cut surfaces, the soft parts, and the length and development of the bones. The presence of wounds capable of producing death should be ascertained and their nature noted. Attempt to destroy the remains by burning or by packing in chlorid of lime may prevent any definite conclusion being reached.

Having decided that all the recovered fragments belong to the same human body, the examination is continued in the endeavor to determine the sex, age, stature, occupation, manner of death, and probable identity of the body, an undertaking that may involve any or all of the questions relating to identity. The remarkable success that not infrequently attends such systematic efforts, even under apparently hopeless conditions, has never been better illustrated than in the case of Dr. Parkman.<sup>1</sup>

Dr. Parkman, of Boston, disappeared on November 23, 1849, and suspicion of his murder was aroused against Professor Webster, as the missing man was last seen alive entering the medical college where Webster was professor of chemistry, for the purpose of receiving money that had long been owed him. A search in the chemical laboratory resulted in the discovery of a pelvis, right thigh, and left leg lying in the vault of a privy, while in the cinders of the furnace were found fragments of cranial bones, of vertebræ, artificial teeth, and a gold plate. In a tea-box covered with tar and minerals were found the left thigh and the trunk, in the left side of which was found a deep stab wound to which the death of the victim was attributed. All these parts when put together fitted accurately, and the lines of incisions showed that they had been made by some one who had an accurate knowledge of anatomy and skill in the use of the knife.

The length of the body, as calculated from that of the long bones, proved to be 70.5 inches, which was exactly that of Dr. Parkman. The age, as shown by the skin, hair, and general appearance, was estimated at between fifty and sixty years, while the sclerosis of the arteries indicated that the age was at least sixty years, which was the age of Dr. Parkman. The teeth and the gold plate were identified by the dentist as those of a peculiar form that he had made for Dr. Parkman, and the fragments of bone reproduced the right half of the lower jaw and showed the absence of teeth, which the dentist proved had been lost by Dr. Parkman. The identity of the dead man was thus positively established. Webster was found guilty and finally confessed the crime.

## EXAMINATION OF THE MIND

Having concluded the consideration of the objective evidences bearing on identity that may be elicited by physical examination of the living or dead body, it remains to consider the importance of a critical examination of the **mental qualities** of an individual. It is not

<sup>1</sup> Comp. *vs.* Webster, 5 Cush., 295.



intended to include here the limitless field of circumstantial evidence, although it has been repeatedly shown that such may be the clearest possible proof of identity. But some remarkable trials have shown that an examination of the mental and moral capacities of an individual, and especially of the memory, may produce the most convincing proof of identity. The conclusions drawn from facts thus elicited are all the more trustworthy because they depend upon the reason and not upon the senses, and because the influences affecting the ordinary laws of mind are very few compared with the limitless number of possible exceptions to physical laws. Thus it is quite possible, although not probable, that an individual should fail to show any traces of a score of cicatrices known to have existed in youth, but it is impossible, at least so far as may be judged by the annals of neuropathology, that an individual otherwise in sound health should, in a few years, entirely forget his native tongue. This abstract evidence may be derived from the examination of the mental capacities, and principally of the memory, of an individual.

**Mental Capacities.**—The decision in some of the well-known cases already referred to was potently influenced by the discovery of wide discrepancies in the mental capacity of two individuals. In the case of Martin Guerre the claimant was shown to be entirely ignorant of the art of fencing, in which Guerre had been an adept. In the Tichborne case it was shown that the claimant was utterly wanting in the rudiments of education, in which Sir Roger had been thoroughly grounded. It appeared also that the claimant did not exhibit certain instincts that must have existed in a man of high birth and breeding. The claimant held tenaciously to habits and tastes that were inconsistent with those of the youthful Tichborne. Indeed, the whole intellectual character of this man was widely at variance with that of the one he pretended to be, and this fact bore overwhelmingly against a strong line of testimony in his favor.

**Memory.**—Even more decisive was the evidence derived from the examination of the memory of the claimants in the above cases. The claimant, Orton, "gave evidence of a tenacious memory, recalling the name of a dog and the number of a trooper's horse, but he failed to remember his supposed mother's Christian name, his place of birth, the companions of his youth, the college where he was educated, his Paris residences, the relatives at whose house he was always a welcome guest, or the friends who helped him. Roger took leave of his dying grandfather at Bath; Orton does not admit of any ignorance of the event, but lays the scene at Knoyle."<sup>1</sup>

No more cogent proof of the falsity of their claims could be desired than the fact that neither Orton nor Dutille could speak the mother-tongue of Tichborne or Guerre, the men they pretended to be. Roger Tichborne's native language was French, which he spoke continuously in France and frequently in England for twenty-five years. When he finally acquired English it was with a pronounced French accent. The claimant, however, could neither read nor speak French, and it was

<sup>1</sup> Guy and Ferrier.

rightly deemed impossible that a man otherwise in sound health could have entirely forgotten his mother-tongue. It might, however, be asked if, with the more advanced knowledge of neurology, some of the rarer forms of aphasia may not involve a complete loss of the mother-tongue. A case reported by Dr. Peterson is here of interest:

A. E., male, fifty-eight years of age, born in Alsace, spoke German and French until his eighteenth year, when he came to America, where he gradually acquired English. At the beginning of his illness he held a position as head waiter, having in his charge 20 waiters with whom he had to speak both French and German. About two years before examination he began to lose the power to speak French and German, and in one month he completely lost the ability to speak these languages, while retaining his command of English. On examination, the sight and hearing were found to be normal. There was no paresis or apraxia. Of English, his reading and comprehension were normal, but there were slight motor aphasia and very slight agraphia. French he could read well, but his comprehension of phrases was imperfect, although he could grasp the main ideas. There were, however, complete motor aphasia and agraphia, and he could neither speak nor write a word of French. German he could read fairly well, but its comprehension was difficult, while he could neither speak nor write a word of German, the motor aphasia and agraphia in this language being complete, as with French. The diagnosis was cerebral softening from endarteritis. The patient then began the study of his native tongues and made for a time some progress in their recovery; afterward the softening became progressive and finally resulted in complete loss of speech.

The judge in the second trial of Guerre's case held it possible that the claimant, after a wandering life of eight years, might have entirely forgotten the language he had spoken for twenty years. It is hardly probable that the courts of the present day would admit such a possibility, for although facility in the use of a language may rapidly fail, the form of speech acquired in youth produces so permanent an impression on the memory that its traces must always be recognizable.

On the other hand, a partial or even striking similarity in the mental character and memory should not be accepted as final proof of the identity of two persons. It will readily be seen that the chief and convincing strength of the claims of Orton and Dutille lay in their familiarity with the lives of Tichborne and Guerre. Had it not been that they possessed a knowledge of many minute particulars of the lives of these men, their dissimilarity in other matters could not have been overlooked. But in both of these cases the knowledge was acquired accidentally and for the intentional purpose of deception. Dutille had long been an intimate friend and comrade of Guerre's, had learned from him the history of his life and his family secrets, and had received from him some family relics at a time when Guerre thought himself about to die. The opportunities for acquiring such personal knowledge, especially at the present day, are so numerous that the

possession of a number of such isolated facts should serve to rouse suspicion rather than confidence.

It must be admitted, finally, that the real conflict of evidence in the above cases centered in the examination of the mind, in the presence of which the evidence derived from the physical examination was largely obscured or variously interpreted according to the weight of other testimony, and it may be claimed with confidence that in such cases a careful and thorough investigation of the mind will, with very rare exceptions, lead to a correct and decisive conclusion.

# THE SIGNS OF DEATH

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DEATH may be defined as the cessation of those physical and chemical processes on which the phenomena of life depend. Animal life, however, is a very complex condition, and while the scientific conception of death requires the complete cessation of all the physico-chemical or molecular processes of life, practically and before the law, the animal body may be dead long before the complete cessation of all the molecular processes of life. The hair and nails, for example, may grow to a considerable length after death.

There is also a variance between the legal and the scientific conception of a living person. The law, as held in England and in some States of America, recognizes as living beings only those born in a condition capable of maintaining an independent existence. Science recognizes the fetus as a living being, and finds it almost as violent a procedure to interrupt the current of maternal blood circulating about the fetus of three months as to cut off the supply of air from an adult man.

The legal scope of the term "death," thus considerably contracted in comparison with the scientific, involves the final and complete cessation of those vital functions upon which depends the life of an individual capable of maintaining independent existence. The physical processes here concerned are chiefly respiration and circulation, on the activity of which life principally depends, and the cessation of which is, usually, readily determined. The fact, however, that molecular activity may persist some time after respiration and circulation have ceased renders the proof of the final and complete cessation of these vital functions often a matter of difficulty, and necessitates a careful consideration of all the **external signs of death**.

Hansemann has pointed out the close and almost altruistic interdependence of the molecular processes and the life of the cells of the various organs.<sup>1</sup> The truth of his conception is well illustrated when death occurs through the sudden interruption of a vital function at a time when cellular activity is entirely normal, and, under favorable conditions, is capable of restoring vital functions after their temporary cessation. On the other hand, in death from infectious diseases molecular or cellular decay keeps pace with or precedes the failure of respiration and circulation, and these functions are seldom restored after once ceasing.

The chief importance of determining the reality of death is not, at the present day, the danger of burying the living, but the possibility that efforts at resuscitation may not be properly attempted in cases of

<sup>1</sup> Die Specificität, den Altruismus, und der Anaplasie der Zellen, Berlin, 1893.



apparent death. There are undoubtedly some well-authenticated instances in which it has been supposed by fairly competent persons that death has occurred and yet the body has been resuscitated. In cases of prolonged syncope and partial asphyxia by drowning, bodies apparently dead have frequently been resuscitated by drafts of cold air or dashes of cold water, or other nervous stimulus. It is possible also that the hasty burial of bodies during plagues or on the battlefield has led to the interment of bodies in which life might have been restored by appropriate measures. But the idea that, with the present methods of disposing of the dead, in civilized countries, it is possible that a body can be buried alive is not to be entertained. Nevertheless, in some localities and classes of society, and with a very few intelligent persons, the possibility of such a catastrophe constitutes a real source of fear.

**Conditions Simulating Death.**—The conditions marked by a temporary inhibition of the respiration and circulation liable to be mistaken for death are *syncope*, *partial asphyxia*, *cataplexy*, and *trance*.

**Syncope**, or the ordinary fainting attack, is usually quickly overcome, and the appearances of death—failure of respiration and heart sounds, coma and pallor—though for a few seconds very alarming, are seldom complete, and soon are replaced by a return of the signs of life. Yet ordinary syncope is always a dangerous condition, calling for immediate and vigorous treatment to prevent the heart failure from becoming permanent. In some cases of syncope, therefore, the only means of determining whether or not *death* has occurred is the *result* of treatment.

**Partial asphyxia**, by drowning or by other means, is a rather frequent cause of apparent death. Attempts at resuscitation have been successful when begun as long as one hour after submersion, and the result in such apparently hopeless conditions shows the impossibility of at once determining the reality of death under such circumstances. It is known that infants asphyxiated during a prolonged second stage of labor, or by pressure upon the cord, may be resuscitated several minutes after the pulse and respiration have ceased.

**Cataplexy.**—This phenomenon in its most pronounced forms is characterized by complete loss of consciousness, of which the onset is usually sudden. The muscles of the whole or a part of the body become rigid, but the limbs may usually be moved and placed in various positions, where they remain for some time. Superficial reflexes are abolished. The sensibility to touch and pain may be lost. The temperature is lowered. The respiration and heart's action are much reduced. "A deficient control of the motor centers of the cortex, permitting their overaction, regulated by different impulses, and repeated in the spinal cord, is the best theory we can at present frame of the condition" (Gowers). The simulation of death produced by cataplexy is usually not marked, and the diagnosis presents no great difficulty.

In **trance** the appearances of death are much more striking, and the condition has in several instances ended fatally. Consciousness may be entirely abolished. The face is extremely pale. The limbs usually

remain flaccid, but may become rigid or show spasmodic movements. The reflexes may be lost, and the pupils may be dilated and immobile. Sensation, although frequently retained or heightened, may be abolished. The pulse and respiration may become temporarily imperceptible. The combination of these symptoms persisting for some hours may present a very close resemblance to death. In the diagnosis Gowers recommends attention to the following points: (1) The absence of signs of decomposition; (2) the normal ophthalmoscopic appearance of the fundus oculi; (3) the persistence of the excitability of the muscles to electricity.

Of the pathologic basis of trance nothing is known. "The phenomena, viewed in the light of the induced varieties, suggest a state of inhibition or at least an inaction of the nerve-cells subserving the higher psychic functions, and that the morbid state spreads to the lower centers in varying degree" (Gowers).

A partial physiologic counterpart of trance is to be seen in the hibernation of some animals: when the heart-beats fall to eight to ten a minute, the respirations are still lower, and the temperature is sub-normal. It is said that some Indian fakirs have the power of holding their breath and passing into a state of trance in which the heart sounds become inaudible. Tidy<sup>1</sup> has collected a number of cases in which the various phenomena of cataleptic trance were fully or partially presented. A well-authenticated and very peculiar case of voluntary suspension of the heart's action and respiration is the well-known story of Colonel Townsend. Cheyne,<sup>2</sup> in describing the case, says: "He told us he had sent for us to give him an explanation of an odd sensation he had for some time observed in himself, which was, that, composing himself, he could die or expire when he pleased, and yet, by an effort, he could come to life again. This it seems he had sometimes tried before he had sent for us. We all three felt his pulse first; it was distinct, though small and thready. He composed himself on his back and lay in a still posture some time. While I held his right hand Dr. Baynard laid his hand on his heart and Mr. Skrine held a clear looking-glass to his mouth. I found his pulse sink gradually, till at last I could not feel any by the most exact and nice touch. Dr. Baynard could not feel the least motion in his heart, nor Mr. Skrine discern the least soil of breath on the bright mirror he held to his mouth. Then each of us in turn examined his arm, heart, and breath, but could not by the nicest scrutiny discover the least sign of life in him. This continued about half an hour. As we were going away, thinking him dead, we observed some motion about the body, and upon examination found his pulse and the motion of his heart returning; he began to breathe gently and speak softly. This experiment was made in the morning and he died in the evening. On opening the body nothing was discovered but disease of the kidney, for which he had long been under medical treatment, all the other viscera being perfectly sound."

<sup>1</sup> Legal Medicine, i, p. 139.

<sup>2</sup> Treatise on Nervous Diseases, p. 307.

## SPECIAL SIGNS OF DEATH

It need hardly be said that, as a rule, the ordinary signs of death are too well known to need description and too striking to admit of doubt. Under some conditions, however, the cessation of the breathing and pulse is not accompanied by any changes in the countenance other than those of sleep. When death occurs in a condition of venous or arterial hyperemia the stoppage of the circulation is at once marked by pronounced changes in the color of the skin; but with gradual heart failure, especially in afebrile states, there may be little or no change in the countenance. It has been noted also that some hours after the signs of death are apparently conclusive the rapid onset of decomposition may produce a flushing of the face and a partial return of life-like appearance. Even the experienced observer, relying usually upon the appearance of the countenance as the readiest indication of death, is sometimes forced to make a careful physical examination before he is able to convince himself as to its actual presence.

The full examination thus occasionally required involves the following considerations:

1. The condition of the circulation.
2. The condition of the respiration.
3. The condition of the muscular system.
4. Changes in the eye.

**The Condition of the Circulation.**—Following from the principle stated at the beginning of this chapter, that life, or the possibility of restoration of a vital function, remains longest in that organ where molecular or cellular activity is most persistent, the condition of the heart and circulation becomes the most important inquiry in the determination of death. In man the heart's action nearly always continues after respiration has ceased, the chief exceptions being seen in deaths from poisoning by cardiac depressants. The heart of a decapitated criminal has been observed to beat for fifteen minutes. In executions by hanging and electricity in this country the pulse commonly persists some minutes after breathing has ceased. In the asphyxia of newborn infants comparatively little attention need be paid to the absence of breathing so long as the heart beats plainly. The anatomic basis of this life tenacity of the heart is found in the high development and automatic character of the cardiac nervous apparatus.

An important factor affecting the possibility of resuscitation after failure of the heart is the coagulation of the blood. When large parietal thrombi form during the last moments of life the vitality of the heart muscles is of little avail in any attempt to restore the circulation. In many instances of sudden death, and in the last stages of wasting diseases, when the coagulation of the blood is feeble, it is possible, by active stimulation, to elicit a few heart-beats or even, in the latter case, to prolong life for some hours.

The only safe method of determining the presence or absence of the heart's action is by careful, prolonged, and repeated auscultation, with



entire freedom from all distracting noises, and it may be confidently expected that when these conditions are properly secured the stethoscope will give entirely trustworthy information in every case. Such favorable conditions being rarely found, the examiner has often to rely upon the unaided ear in auscultation, and the result of the examination may not be convincing.

Further, as is well known, in very corpulent persons the normal heart sounds may be rather indistinct because of the thickness of the chest wall. Some pathologic conditions may increase the natural difficulties of the case. In chronic interstitial or fatty myocarditis the heart sounds are usually feeble and may be indistinct. With pericardial effusions the heart sounds may be very obscure; while cases of transposition of the viscera or of displacement of the heart from chronic inflammation of the lungs are occasionally encountered.

When the results of auscultation remain unsatisfactory, resort may be had to some of the numerous tests devised to demonstrate the condition of the peripheral circulation. In using these tests it must be admitted that they are necessarily less reliable than direct auscultation, for the reason that the peripheral circulation may be practically at a standstill, although the heart is still feebly beating.

One of the most reliable of these tests is that suggested by Magnus.<sup>1</sup> If a ligature is applied to a finger or, if the skin is horny, to a lobe of the ear, so as to cut off the venous channels without occluding the arteries, when the circulation has not entirely ceased the distal area will become gradually engorged with blood, and its color will become first reddish and finally cyanotic. At the same time the capillary anemia about the ligature produces a white ring plainly marked off from the surrounding area of congestion. The success of this test will naturally depend on the exact adjustment of the pressure so as to compress the veins without occluding the arteries.

It has been stated that if wet cups are applied to the skin a few hours after death, no blood will flow, while if the circulation still feebly persists, blood will readily appear under the cup. The result in this case depends upon the condition of the blood in the small vessels incised, which is well known to be variable. Wounds have been found to bleed for two or three hours after death.

The **diaphanous test of death** has been the subject of considerable recent discussion. It has long been known that if the hand of a living person be held before a strong light, it almost invariably appears scarlet or very red, while after death the appearance of the hand under similar conditions is usually opaque. It has been claimed that opacity of the hand after death is caused principally by the coagulation of the blood, for in cases in which the blood has remained fluid in the large veins this life-like scarlet color has been demonstrated after death. But the opacity indicating death has been observed in syncope, when the blood must always remain fluid. While the exact conditions determining the appearances in the diaphanous test must, therefore, be regarded as

<sup>1</sup> Virchow's Arch. f. path. Anat., 1872, Bd. lv



unknown, the test has shown itself, by long experience, to give valuable *corroborative* evidence of death.

**The Condition of the Respiration.**—The complete and prolonged absence of respiration is a sign of death second in importance only to the cessation of the heart's action. In a few conditions respiration may continue for a short time after the heart has ceased beating; a reversal of the usual order of events is probably most often seen in heart failure during anesthesia. But the respiratory function is much less capable of withstanding unfavorable conditions than is the heart's action. When respiration ceases suddenly, while the vitality of the heart is unimpaired, the resulting asphyxia is marked by great venous congestion. When the asphyxia is gradual, as sometimes occurs in croup and in laryngeal stenosis by tumors, the heart's force is often much reduced by the continued lack of oxygen or by other causes, and the patient may die with marked pallor instead of cyanosis. This important fact is frequently overlooked, and the writer has seen patients with laryngeal stenosis die, with pallor, while the surgeon, with instruments ready, was waiting for the appearance of cyanosis before performing tracheotomy. The pallor of a body or corpse is, therefore, no certain indication that respiratory failure has not been chiefly answerable for death.

There is much variation in the length of time required for complete lack of air to produce fatal asphyxia. Most healthy persons have difficulty in holding the breath for a full minute.

In rare instances, usually after long training, the breath has been held for four or five minutes, a period which will ordinarily suffice to render most persons unconscious. Death has repeatedly occurred after submersion in water for five minutes, although resuscitation has been successful after the body has lain in water one hour. As in the case of the circulation, the possibility of restoring respiration depends on the vital condition of the respiratory center. Circumstances are most favorable when asphyxia occurs in health, less so when ether, chloroform, or carbonic oxids have poisoned the nervous system or altered the blood, and least so in death from general diseases.

In catalepsy, as before mentioned, the breathing may temporarily cease or become so superficial as to escape detection. In severe opium poisoning it should be remembered that the respiration may fall to two or three a minute, and may be so superficial as to escape notice unless careful and continuous examination is made over a period of some minutes. In profound shock the respiration may be very superficial. In the Cheyne-Stokes variety of respiration, which has been observed at nearly all ages and in a great variety of conditions, the interval between the deep and easily recognized respirations may be as long as two minutes.

When it seems probable, from external signs, that respiration has ceased, this fact may best be finally determined by the following procedures:

1. Careful and prolonged auscultation may be made over the chest,

trachea, and larynx, but very feeble respiratory movements may produce no appreciable sound in these localities.

2. It may be possible to demonstrate that warm moist air is being exhaled from the nostrils by holding a mirror before the face, on which any moisture passing out of the nostrils will condense in visible form. But according to Tidy, a mirror placed over the mouth of a hibernating animal is not dulled, and other instances are recorded, of which Colonel Townsend's is one, in which this test failed. It may be recommended that the mirror used in this test be made very cold, in order more effectually to condense any moisture present.

3. The presence of very faint currents of air may be detected by the movements of cotton fibers placed over the mouth and nostrils.

4. Slight movements of the chest wall, ordinarily invisible, may be detected by carefully observing the surface changes of a vessel of water or mercury placed upon the chest.

It is not probable that the two last-mentioned procedures will demonstrate any respiratory movements not detected by the first and second methods, and when repeated and prolonged auscultation can be properly performed, except in very rare instances it may be expected to give reliable and final evidence of the presence or absence of respiratory movements.

**The Condition of the Muscular System.**—Complete muscular relaxation is usually an essential condition in death, although its presence is, of course, no indication of the reality of death. Cataleptic rigidity has, however, been observed to pass without interruption into **rigor mortis**, and numerous instances are recorded in which rigor mortis has followed immediately upon sudden death, usually in states of mental excitement or active muscular exertion. In the majority of cases, especially of those in which the reality of death is questioned, there is a considerable period of complete muscular relaxation. During this period the contractility of muscle is not lost for some time, and, as will be shown later, its persistence is no indication of life. If, however, the muscles fail to respond to electric stimuli, barring some forms of nervous disease it may confidently be stated that death has occurred.

**The Facial Appearance.**—As a combined result of the failure of respiration and circulation and the loss of muscular tone certain characteristic alterations in the countenance occur which have long been described as the *facies Hippocratica*. In this condition the appearances may be referred chiefly to the anemia of the tissues and the loss of muscular tone. The skin is dry and livid, the eyes are shrunken, the drawn muscles cause the nose, cheek, and chin to appear unnaturally prominent, while the lips are pale and flaccid. The *facies Hippocratica*, while in many cases a convincing sign of death, has very little positive value, being usually absent in cases of sudden death, persisting generally only a short time after death, appearing in striking form in the dying or even in cases of extreme terror. The cause and manner of death have much influence in determining the appearance of the face of the corpse.

Painful death usually leaves abundant traces of the previous mental condition of the individual. After sudden death the facial expression present immediately before is frequently preserved in recognizable form.

**Changes in the Eye.**—No positive signs have as yet been elicited in the eye to prove the reality of death soon after its occurrence. The conjunctiva is insensitive, and a thin film of mucus usually gathers over the cornea, which thereby loses its luster, but each of these conditions may be observed occasionally in the living, and the latter is not an invariable accompaniment of death. It has been noted after death from apoplexy and from poisoning by prussic acid or carbonic oxids that the conjunctiva long remains shiny and the eyeball elastic. The gases developed by putrefaction may distend the vessels of the orbit and maintain the prominence of the eyeball and the natural color of the conjunctiva. Cadaveric changes of color of the conjunctiva are sometimes observed very soon after death.

The iris is flaccid, and the pupil is usually moderately dilated and irresponsive to strong light, although solutions of atropin or of eserin may alter the size of the pupil for at least a half-hour after death (Tidy). The shape of the pupil may also be altered by appropriate pressure on the relaxed fundus, but this effect has been noted to a lesser degree during life.

A marked loss of elasticity of the eyeball is not usually noticed until a few hours after death, and must be reckoned among the cadaveric changes, but occasionally the eyeball is found distinctly softened immediately after death. The same condition has been observed before death, however, and its presence is not of decisive import in the diagnosis. Nicati<sup>1</sup> has invented an ophthalmotonometer, from the use of which he claims to have demonstrated that the physiologic limits of the tension of the eyeball vary between 14 and 25 grams; with the cessation of the heart's action it falls to 12 grams, then irregularly to 1 to 3 grams; and two hours after death it sinks to zero.

Some indications of interest and value may be obtained from ophthalmoscopic examination. It is stated by Poncet, quoted by Tidy, that the anemia of the fundus after death is very evident in the yellowish-white color which replaces the yellowish-red of the living condition. Gayet<sup>2</sup> says that after death the vessels of the fundus are completely emptied in the optic disc, and for some distance about it, while in the remainder of the fundus the vessels remain filled with blood. Pneumatosis of the veins of the fundus is regarded by Bouchet<sup>3</sup> as a reliable and immediate sign of death. This condition is supposed to be produced by the disengagement of the gases of the blood in the form of minute bubbles, plainly visible in the broken column of blood in the veins. It would seem that the condition of the vessels of the fundus must depend much upon the position of the body and the manner of death.

<sup>1</sup> *Lancet*, Feb. 17, 1894.

<sup>2</sup> *Annales d'oculistique*, Jan., 1875.

<sup>3</sup> *Gaz. d. Hôpitaux*, Mar. 10, 1874.



## CADAVERIC CHANGES

While none of the signs, as outlined above, can of itself be regarded as a conclusive proof of death, it cannot be admitted at the present day that in the hands of a competent person the complete examination of the body, even with reference to these so-called "inconclusive signs," can ever lead to a false diagnosis of death. Yet none of the phenomena thus far considered gives any indication of the length of time that life has been extinct. The presence of *cadaveric changes*, however, is conclusive proof of the reality of death, and the sequence of these changes furnishes important evidence as to the time of death. It, therefore, becomes necessary to study in detail the process of cadaveric changes in the body.

**The Extinction of Animal Heat.**—The cooling of the body, considered as a sign of death, cannot be regarded as decisive evidence until the temperature has fallen 15 or 20 degrees, for rectal temperatures of 94° F. have been observed in the algid stage of cholera, and much lower temperatures (76° F., Ziegler) are not incompatible with life under long exposure to cold.

The rate of cooling is affected by such a variety of circumstances that in the majority of cases it is impossible, from the temperature of the body, to draw a positive inference as to the time of death.<sup>1</sup> Thus it is possible for the body to have at death a temperature of 120° F. after death from sunstroke, or of 80° F. after death from cold; in the former case several hours must elapse before the body could cool to the temperature observed at death in the latter case. Moreover, a high antemortem temperature may be long maintained or even increased after death from cholera, yellow fever, small-pox, tetanus, rheumatism, nephritis, and from some diseases of the brain and meninges.

This **postmortem elevation of temperature** has been variously attributed to failure of the circulation, by which the blood is aerated and cooled, to failure of the heat-regulating center, to excessive metabolic processes during and after death, and to the chemical changes of decomposition. Distinct postmortem elevations of temperature have been observed from the diseases just mentioned, and may be expected to occur when death has been preceded by violent muscular spasm.

In general, the cooling of the body is more rapid after chronic and wasting diseases, when the loss of heat begins in the extremities before death; while after acute diseases or sudden death the process of cooling is usually much slower. The rate of cooling is principally affected by external conditions, the temperature of the surrounding air or water, and the clothing of the body. The bodies of old and emaciated subjects cool much more rapidly than those of large and corpulent adults.

Notwithstanding the wide variations in the rapidity of the cooling process thus indicated, there exists a large class of cases in which ordi-

<sup>1</sup> Vaughan (Jour. Amer. Med. Assoc., 1921, 76, 608) attempts to determine the approximate time of death by dividing the lower extremity into ten parts and making an allowance of one hour for each division, determining by sense of touch the difference in temperature (time of cooling) in each section.



nary conditions prevail and in which the extinction of animal heat proceeds more uniformly. The ordinary course of postmortem cooling has been made the subject of several extended observations, undertaken with a view to determining the relation of the temperature of the corpse to the period of death. Taylor and Wilks<sup>1</sup> made about 200 observations on the external temperature of bodies removed from the wards of Guy's Hospital and allowed to cool in the dead-house, where the temperature ranged between 38° and 59° F. The temperatures were taken upon the skin of the abdomen, at intervals during the first twenty hours after death, but the temperatures immediately after death, and for the first two hours thereafter, were not observed. In spite of these deficiencies in technics and in the completeness of the observations, their results showed conclusively that under ordinary circumstances the cooling of the body proceeds very slowly, the surface temperature not approaching that of the surrounding air for at least twenty hours after death. In no case, even after twenty hours, did the temperature of the body fall as low as that of the air. Of 76 observations in which the temperature was taken two or three hours after death, the maximum found was 94° F., the minimum, 60° F., and the average, 77° F. The average temperatures found at different periods were, at two to three hours, 77° F.; at four to six hours, 74° F.; at six to eight hours, 70° F.; at twelve or more hours, 69° F. It appears, therefore, that the cooling proceeds more rapidly soon after death, and more slowly as the temperature of the body approaches that of the air. The minimum temperature found two hours after death was 60° F., and twelve hours after death 56° F., results so nearly equal as to prohibit the application of any fixed rule regarding the external temperature of the body at different periods after death.

Niederkorn made 135 observations on the **axillary temperature** of bodies subjected to ordinary conditions, with the following average results, Fahrenheit scale:

Temperature of body after death.	Two to four hours.	Four to six hours.	Six to eight hours.	Eight to twelve hours.
Maximum.....	109.4°	98.2°	95.3°	100.4°
Minimum.....	89.6°	80.6°	70.5°	62.6°
Average.....	96.9°	90.2°	81.7°	77.9°

As is to be expected, the course of the axillary temperature gives, therefore, more accurate indications of the time that has elapsed since death than does that of the surface temperature of the abdomen.

Of **internal temperatures**, Taylor and Wilks record instances of 76° F. seventeen hours after death, and of 85° F. ten hours after death. Niederkorn found that the rectal temperature in 6 cases averaged 90.6° F. six to eight hours after death, and 89.2° F. twelve to fourteen hours after death. Letheby, quoted by Tidy, found the rectal temperature to be 18° F. and the axillary temperature 14° F. higher than that of the air as long as twenty to twenty-four hours after death. The *rate of cooling* has been found by Goodhardt<sup>2</sup> during the first three

<sup>1</sup> Guy's Hospital Reports, 1863, p. 184.

<sup>2</sup> Ibid., 1870.

hours to be 3.5° F. in the robust and 4.5° F. in the emaciated; during the second three hours, 3° F. in both; and about 1° F. an hour as the temperature of the body approaches that of the air.

It is very apparent from the incompleteness of the studies cited that it is impossible at the present time to determine accurately the time of death from observations on the temperature of the corpse. In order to reach any conclusion of value it is necessary to consider the cause of death, the antemortem rise of temperature, the condition of the surrounding medium, and all circumstances favorable or unfavorable to the extinction of animal heat. It seems probable that observations on the course of the rectal temperature in cadavers, together with a study of the causes affecting postmortem internal temperature, might secure much valuable information in regard to this rather important medico-legal inquiry.

**Changes in the Muscular System.**—In the majority of instances death is followed by a considerable but very variable period of muscular relaxation. During this period, which does not usually continue longer than two or three hours, although it may be moderately prolonged, the muscles retain their mechanical and electric irritability, and may be made to contract with some force by repeated blows from the hand or by the application of the electric current. Rosenthal<sup>1</sup> examined the electric irritability of the muscles and nerves of 20 bodies dead from various causes, using the continuous and interrupted currents. He found that the electric reaction of the muscles outlasts that of the nerve-trunks, and is longest retained in the muscles farthest removed from the cerebrospinal axis. He believes and cites a striking case to show that the **loss of electric irritability in all the muscles** is a very positive sign of death, and in the absence of other reliable signs may be of decisive value in diagnosis.

The loss of electric reaction in a single muscle or group of muscles cannot be accepted as evidence of death, as this condition may be seen during life in portions of the muscular system under a variety of circumstances. After complete muscular exhaustion the electric reaction of some muscles may be largely or entirely suspended. Diseases of the muscles, such as pseudohypertrophic paralysis, or of the brain, cord, and peripheral nerves, may destroy electric excitability. Certain muscle poisons, as the nitrites, may completely suspend muscular irritability. Long-continued exposure to cold at 28° to 38° F. suspends muscular excitability, while the continued action of heat of 120° F. coagulates myosin and destroys contractility.<sup>2</sup>

The degree of postmortem muscular irritability may be of much assistance in determining the time of death. Muscular contractility is commonly lost within three to six hours after death, and no case is recorded in which it persisted twenty-four hours. Animus<sup>3</sup> states that the diaphragm and tongue first lose their irritability; the facial muscles

<sup>1</sup> Journal of Anatomy and Physiology, Nov., 1872.

<sup>2</sup> Richardson's Croonian Lectures, 1873.

<sup>3</sup> Le Mouvement Med., Feb., 1873.

retain this property for two to three hours; the extensors of the limbs for four hours; the muscles of the trunk for five to six; and the muscles of the abdominal wall some time longer.

According to Nyster, the loss of muscular irritability occurs in the following order—left ventricle, intestines, stomach, bladder, right ventricle, esophagus, iris, muscles of trunk, muscles of upper and lower extremities, and, lastly, the muscles of the heart. The cause and manner of death affect the persistence of muscular irritability, as pointed out by Tidy from the observations conducted at La Charité, where it was found that after death from peritonitis, muscular contractility commonly disappeared in three hours; from phthisis and carcinoma, in three to six hours; from cardiac disease and hemorrhage, in nine hours; from paralysis, in twelve hours; and from pneumonia, in ten to fifteen hours.

The possibility of spontaneous muscular movements during the period of muscular irritability seems to be fairly well attested. To such spontaneous contraction may sometimes be referred the closing of the lower jaw after death. Tidy<sup>1</sup> reports having observed movements of pronation, supination, and flexion in a body dead seven hours, during the cholera epidemic of 1860. So far as he could judge, they were absolutely spontaneous. Similar movements have been observed by others after death from cholera and yellow fever, but in judging this evidence it is to be remembered that rigor mortis produces a shortening of the muscle, with results sometimes identical with those of true contraction.

**Rigor Mortis.**—The period of muscular relaxation and contractility is commonly succeeded by a period of muscular rigidity, or rigor mortis. This phenomenon is produced by the formation of myosin, probably through the action of a *ferment* upon a hypothetic protein, *myosinogen* (Kühne). Of the properties of myosin, one is of special importance here, namely, its capability of being transformed into syntonin by the action of dilute acids. To this transformation, under the influence of lactic acid, is probably due the disappearance of rigor mortis as putrefaction begins in the body, although it is probable that the small quantity of pepsin found in muscle may also have a considerable part in dissolving myosin and causing the disappearance of rigidity. After the loss of rigidity, peptones and other products of gastric digestion are found in the substance of muscle (Neumeister).

In addition to *myosin*, which coagulates at 56° C. (132.8° F.), muscle in a condition of rigor mortis contains another allied substance, *musculin*, coagulating at 47° C. (116.6° F.), to the formation of which is due the rigidity produced when fresh muscle is heated to 47° C. (116.6° F.) (Halliburton). Ordinary fresh healthy muscle is neutral in reaction or has a slight tendency toward alkalinity. It becomes acid during rigor mortis, from the development of lactic acid, and finally alkaline, from the development of ammonia during decomposition (Neumeister). Actively tetanized muscle becomes slightly acid in reac-

<sup>1</sup> Legal Medicine, i, p. 55.



tion, and the total quantity of lactic acid finally produced in such a muscle is greater than usual. The reaction of heart muscle is slightly acid (Kühne, Voit). The appearance of rigor mortis does not indicate the death of a muscle, for it has been shown that if a current of alkaline arterial blood be passed through a rigid muscle, it becomes flaccid and capable of contraction under electric stimulus (Brown-Séquard). The similarity in the chemical processes occurring in muscle during contraction and during the formation of rigor mortis has been pointed out by Hermann, who regards rigor mortis as only a modified form of true contraction.

So far as is known, the phenomena of rigor mortis in involuntary muscle are similar to those of voluntary muscle. The heart often becomes rapidly rigid and of distinctly acid reaction. In the stomach and uterus rigor has been observed, but in other situations it is difficult to determine the condition of smooth muscle, and rigor has never been satisfactorily demonstrated (Halliburton).

**Period of Onset of Rigor Mortis.**—From various observations it appears that rigidity affects some groups of muscles usually within the first two hours after death. Niederkorn found that in all of 113 cases one or more joints became rigid within this period. In the heart, rigor commonly appears at the end of the first hour, and the increased thickness and firmness thus resulting, especially if found at a time when other muscles are flaccid, may lead to an incorrect diagnosis of cardiac hypertrophy. Similarly, the rapid return of extreme flaccidity in this organ may give the impression of cardiac atrophy or degeneration.

The difference in time required for the appearance of rigor mortis in the various muscles probably depends upon some difference in their chemical condition, the nature of which is undetermined. A number of established facts may be mentioned as indicating that the rapidity of its onset is partly favored by a diminished alkalinity of the muscle substance. The left ventricle, of which the reaction is slightly acid, is usually the first muscle to become rigid. In a number of conditions attended with great muscular activity, as overexertion, tetanus, strychnin poisoning, which diminish the alkalinity of muscle, death is very soon followed by rigor.

Beginning, then, in one or more groups of muscles, rigor mortis is usually complete or reaches its height in one to two hours after its onset. In two of Niederkorn's cases it was complete in two hours after death. Rigor may, however, be very long delayed or may be so slight as to escape notice. A *slow onset* of rigidity may be expected after death in conditions of full muscular vigor, as by apoplexy or by injuries to the brain or medulla. The bodies of decapitated criminals have been known to remain limp for several hours, death from hemorrhage being, perhaps, the commonest cause of delayed rigor. Amputated limbs usually remain flaccid for many hours. After death from asphyxia, especially of newborn infants, rigor is often long delayed and of diminished intensity. Rigidity is delayed in death from acute irritant poisons, but a rapid onset is favored in poisoning by quinin, caffeine,



digitalis, veratrin, hydrocyanic acid, ether, chloroform, and small doses of strychnin. As cold prevents the action of the myosin-producing ferment, rigor is of late occurrence after death from this cause.

A *rapid onset of rigor mortis*, which is of rather greater medicolegal interest than its delayed appearance, may be expected, generally, in conditions marked by great muscular exhaustion. For the fullest production of rigidity, however, a powerful muscular system is required. As myosin and musculin coagulate at 56° and 47° C. respectively, a high temperature at death naturally favors the prompt onset of rigidity. Apart from the very early or immediate rigidity of a single muscle, as of the heart, eyelids, and face, which may considerably precede a similar change throughout the body, general muscular rigidity sets in early after death from long-continued fevers, pulmonary tuberculosis, cholera, hydrophobia, and poisoning by large doses of strychnin. Complete rigidity has often been noted while the body was still warm. Brown-Séquard reports a case of beginning rigor while the heart was still beating, at death from typhoid fever. Stiffening of the eyelids not infrequently occurs while the heart's action continues (Guy). The *instantaneous onset of rigor mortis* occurs so frequently after sudden death during violent muscular exertion, and the immediate fixation of the body in the exact attitude and expression at the moment of death has been so life-like, that many remarkable instances of this sort have become matters of common reference. It is reported that at the battle of Antietam Creek the bodies of some Union soldiers killed in the exhausting charge near the bridge were found rigidly set in the act of climbing an obstructing fence, or crouched behind the fence in the act of firing, while the intense excitement of the charge was plainly visible in the fixed expression of the face. A startling incident of the charge, at Balaklava is recorded by Ogston: "Captain Nolan, while riding in advance of the cavalry, had his chest torn open by a Russian shell. The arm he was waving in the air at the moment remained high uplifted, and he retained his seat on his horse, which wheeled around and passed some distance through the ranks before the rider fell."

The instantaneous onset of rigor mortis has often given decisive evidence of the manner and circumstances of death. It has at times been possible, in this way, to determine the existence of fear or other violent emotion at the time of death. The position of the body has often indicated that a violent struggle occurred before death, and even gives evidence of the exact nature of this struggle, as after death during criminal assault. Articles grasped in the hands at the moment of death prove of extreme importance in deciding upon the circumstances of the death. Portions of the hair and clothing of the murderer have been found in the hands of the victim. Weapons *firmly* grasped in the hand, as is possible only when rigidity supervenes instantly, have indicated suicide or self-defense, according to the position of the weapon; and, on the other hand, weapons purposely but loosely and awkwardly placed in the hand of the victim by the assailant have correctly indicated a murderous assault. After poisoning the vial containing the drug has

been found firmly grasped in the hand of the suicide. Bodies recovered from the water have brought with them, clutched in the fingers, weeds and mud from the bottom, showing that death occurred in the water and not on the land. The position of the body with reference to the surface on which it lies may be an important consideration. When rigor mortis occurs while the body is sitting upright in a chair, or crowded into a confined space or corner, or lying on rough ground, the shape of the limbs, buttocks, and trunk will be accurately applied to the contiguous objects. It may thus be possible to determine whether a body has been moved after rigor mortis has set in.

Rigidity has been observed to follow immediately upon muscular spasm occurring in life, and has been noted especially in death from tetanus and strychnin poisoning. Falk<sup>1</sup> has shown experimentally that tonic muscular spasm in rabbits may be prolonged for a short time after death and be followed without interruption by true rigor mortis. The theoretic interest of these experiments lies in the demonstration that muscular contraction of purely nervous origin may pass indistinguishably into postmortem rigidity, which results from a chemical process entirely independent of nervous influence.

Practically, the question arises with reference to the cases of instantaneous rigor mortis seen on the battlefield and elsewhere, whether tonic muscular contraction does not continue in these cases some time after death, while the true rigor mortis supervenes, not instantly, but after the lapse of some seconds or minutes.

The order in which the muscles are affected by rigor mortis has been variously stated by the older authorities—Nysten, Larcher, Caspar, and Niederkorn. These older conclusions are somewhat altered by Ogston and Tidy, both of whom give the following order of involvement: The eyelids are first affected, then the muscles of the lower jaw, followed by the remaining flaccid muscles. The lower limbs are next involved, but both upper and lower extremities frequently become rigid simultaneously.

The *disappearance of rigor mortis* proceeds in the order of its onset, and it may be stated as a very reliable rule that the earlier its onset, the more rapid is its disappearance. After death from exhausting diseases, in subjects of poor muscular development, rigidity may, therefore, be expected to appear promptly and disappear early, and may at times escape observation. In old age rigidity is usually well marked and persistent; in adults it is rather less prominent in proportion to the muscular development; but in infancy pronounced rigidity is observed even after death from asphyxia.

It cannot be said that there is any fixed *period of the usual continuance of rigor mortis*, and it is only from a study of all the circumstances of an individual case that any opinion can be given as to its probable duration. Taylor gives the usual period as sixteen to twenty-four hours; Ogston, twenty-four to thirty-six hours; Tidy, twenty-four to thirty-six hours in summer, thirty-six to forty-eight hours in winter. Under favorable circumstances, as after death by hanging or decapita-

<sup>1</sup> Berliner klinische Wochenschrift, 1893, S. 880.

tion, bodies have remained rigid until the eighth day. Kussmaul states that after sudden death in muscular subjects rigidity often persists for two weeks or longer.

**Changes in the Blood and Vessels.**—Many of the alterations found in the blood at postmortem are the results of processes occurring in the last hours or moments of life, and it is often difficult to distinguish all vital from postmortem blood changes. According to Schmidt, the *coagulation of the blood* is effected by the action of a fibrin ferment, derived principally from the leukocytes, upon paraglobulin, the fibrinoplastic substance of the plasma. When the heart's action is gradually enfeebled and other conditions are favorable, parietal thrombi frequently form in the slowly moving blood of the heart chambers. These thrombi are found closely adherent to the heart wall or extending into adjoining vessels, and on section are found to be composed of fibrin and leukocytes, with a slight admixture of red cells. They are rather tough and elastic, and give evidence of having been subjected to the heart's action. When the circulation has entirely ceased, the blood settles in dependent vessels exactly as it does in the test-tube, the red cells, being of greater specific gravity, settle to the bottom, and clear, translucent, jelly-like clots form in the supernatant fluid, in which are suspended many leukocytes. These true postmortem clots are found in the larger vessels, and usually only in the veins, in which the blood collects after death, and they may be directly continuous with the parietal thrombi. The position of the layers in postmortem clots indicates the position that the body has occupied at the time of the coagulation of the blood.

The **extent of coagulation** will depend on the cause and manner of death. According to Hoffman, the extent of coagulation stands in direct relation to the length of the death struggle. The fibrin ferment being principally derived from the leukocytes, the presence of well-marked leukocytosis will favor extensive coagulation. The investigations of Corin<sup>1</sup> indicate that the extent of postmortem coagulation depends, on the one hand, upon the amount of fibrinogen and fibrin ferment in the blood, and, on the other hand, upon the action of a principle, secreted by the vessel walls, which inhibits the action of the fibrin ferment. This inhibiting principle being abundant in the capillaries, the blood in small vessels commonly remains fluid after death.

The wide variations observed in the coagulation of blood after death may be partly explained by a consideration of the foregoing factors. The most extensive coagulation is observed after slow death from infectious fevers attended with marked leukocytosis. The blood usually remains fluid after death from asphyxia, from burns, and in poisoning by opium, hydrocyanic acid, phosphorus, and carbolic acid. After death from diseases attended with anemia the blood clots feebly in proportion to the severity of the anemia. When large infusions of salt solution have been used in the treatment of acute hemorrhage, the blood is usually found entirely fluid after death.

<sup>1</sup> Vierteljahresschrift für gerichtliche Medicin, v, S. 234.



The **color of the blood** during the last moments of life becomes distinctly darker, from the reduction of oxyhemoglobin to hemoglobin, a change which is ordinarily so complete that it is impossible to demonstrate by the spectroscope any oxyhemoglobin in cadaveric blood from which all air has been excluded (Hoffman). Various exceptions to this rule are seen in the color of the blood after death by some poisons which have a special action upon hemoglobin. The blood is of bright red color after death from burns, from cold, or from poisoning by carbonic oxids. It is dark brown after death from sulphuric acids; chocolate brown after poisoning by potassium chlorate; and usually dark brown in phosphorus poisoning.

**Postmortem hypostases** are characteristic signs of death which make their appearance sometimes within an hour, frequently within six hours, and usually within twelve hours after death, in the form of dark red discolorations of the skin over dependent portions of the body. They are produced by the distention with blood of the capillaries and small veins of the *rete mucosum*, and their size and number depend chiefly upon the quantity of blood in these small vessels at the time of death (Zeigler). Capillaries being microscopic structures, the result of their distention is a uniform discoloration of the affected area. Hypostases are not formed where the capillaries have been emptied by pressure of the bedding, and the marks of clothing or constricting bands are plainly indicated by bloodless streaks.

Hypostases occur not only in the skin, but may usually be found in the serous surfaces over dependent portions of the internal viscera. Over the posterior surfaces of the lungs they are almost invariably found, and in this situation they may make their appearance very soon after death. The cerebral and spinal pia is often markedly affected. The wall of the gastro-intestinal tract is frequently discolored by post-mortem settling of blood. This may be distinguished from inflammatory changes by the absence, in the former case, of the discoloration at the points where sharp bends of the canal have compressed the blood-vessels. Discolorations of the serous surfaces of intestinal viscera are more often to be referred to inflammatory ecchymoses than to simple hypostasis, and it is manifestly important to avoid any confusion of these conditions.

**Postmortem lividities of an entirely different origin** may arise, usually at a somewhat later period, from the diffusion of the coloring-matter of the blood into the tissue surrounding the capillaries and larger vessels. This form of lividity, in an extreme degree, produces the bluish-red streaks arising from the diffusion of the blood-pigments from the larger veins of the skin, and often marking out the entire network of a large area of cutaneous veins. The stains first appear in isolated patches, which gradually enlarge, coalesce, and finally may cover a considerable portion of the skin. Combinations of both forms of lividity probably occur with considerable frequency.

Both forms of postmortem lividity are to be distinguished from each other and from ecchymoses and extravasations of blood that have



formed during life. The extravasation of blood usually produces an elevation of the cuticle, which never occurs in simple postmortem lividity. On section, the coagulated or fluid blood of an extravasation lying in the meshes of the tissue can, as a rule, be partly displaced by continued pressure. When a cut is made through a simple hypostasis, while the blood in the capillaries cannot be entirely displaced, pressure will cause the blood to exude from the small veins in the form of fine black points—*puncta cruenta*. The lividity produced by diffusion of coloring-matter is entirely unaltered by pressure.

The *extent* of postmortem hypostasis is frequently proportionate to the amount of fluid blood in the cadaver. It will therefore be less after death from acute infectious diseases, such as pneumonia, in which a considerable volume of blood usually coagulates soon after death, and greater after death from such causes as retard the coagulation of the blood. But although hypostatic mottling is certainly diminished by rapid coagulation of the blood in large vessels, it does not appear that the formation of hypostases depends exclusively upon the length of time that blood remains fluid. As the blood in capillary vessels remains fluid (Corin) and coagulation never involves the entire volume of blood, there must always remain in the veins a considerable quantity in a condition capable of gravitation to the dependent capillaries. It is probable, therefore, that the activity of the cutaneous circulation and the quantity of blood in the capillaries at the time of death, as stated by Zeigler, are the more important factors in the formation of hypostases. Further, the mottling of the skin usually appears some hours later than the ordinary period of the coagulation of the blood. Yet Corin<sup>1</sup> was able to increase the formation of postmortem lividities in rabbits by injections of peptone, which diminishes the coagulation of the blood.

As a positive sign of death the value of cutaneous lividity has been variously regarded. There can be no doubt that extensive discolorations, limited to dependent regions, is a positive and sometimes very early proof of complete failure of circulation. According to Tidy and Caspar, postmortem hypostases are invariably to be found in some part of the body, even after death from hemorrhage, a statement denied by Ogston. Their presence must be very constant but hardly invariable, as indicated by the case recently reported by Chlumsky,<sup>2</sup> in which an entire absence of postmortem lividity was observed in the body of a woman killed by a crushing blow on the skull and numerous stab wounds, and thrown immediately into ice-cold water.

Extreme venous congestion of the skin, especially in circumscribed areas, may occasionally simulate the real postmortem stasis, but may be recognized by its distribution and complete displacement by pressure. The ecchymoses produced by frost-bite are sometimes difficult to distinguish from postmortem lividity, but the situation and outline of these lesions will usually serve as a guide. Bruises of the skin inflicted

<sup>1</sup> Archives de Physiologie, 1892, No. 4.

<sup>2</sup> Vierteljahresschrift für gerichtliche Medicin, x, sup., S. 22.

shortly before death may be distinguished by the usual injury of the epidermis, by the shape and size of the discolored area, which are determined by the instrument used, and frequently by the slight elevation of the injured area due to the effusion of blood. Bruises inflicted a few days before death usually show inflammatory reaction, hyperemia about the edges, and characteristic changes of color in the effused blood. In many hemorrhagic and infectious diseases petechial spots or large ecchymoses appear in the skin, which can seldom be mistaken for post-mortem lividity. Nor will the cutaneous ecchymoses sometimes observed in hysteria and catalepsy lead to any great difficulty in diagnosis. In the last stages of some diseases associated with extreme anemia death may be forestalled by the appearance of a multitude of superficial petechiæ often resembling hypostases. In cases of suffocation, especially by carbonic oxid, discolored patches are sometimes seen on the face, which may be difficult to distinguish from postmortem lividity.

**Putrefactive Changes in the Body.**—The putrefactive processes that occur in the body after death are largely the result of chemical processes initiated by and dependent upon the growth of bacteria. The action of various unorganized ferments present in the tissues has also considerable influence upon these processes, and frequently the higher forms of animal life are active agents in the destruction of the tissues.

The very complex nature of these processes, the natural difficulties in the way of a bacteriologic study of the cadaver, and the comparative lack of practical value in the solution of such questions have prevented any exhaustive studies in this field. The gastro-intestinal tract always contains a large number of putrefactive bacteria, and the blood and vessels serve as the natural channel for their dissemination throughout the body. It has been shown by numerous researches that some pathogenic and putrefactive species, such as *Bacillus coli communis* and *Bacillus proteus*, may be carried to the internal viscera even before death, especially when the fatal lesion includes some disturbance of the gastro-intestinal tract (Welch, Neisser). The terminal septicemias of many chronic or acute diseases also leave the body in a specially favorable condition for rapid decomposition.

Ottolenghi,<sup>1</sup> in a study of the bacteriology of the blood of the cadaver, found that forty-eight hours after death, with the body in a state of beginning decomposition, the bacteria found in the heart's blood were almost exclusively *Bacillus mesentericus vulgaris*, *Bacillus subtilis*, and *Micrococcus albus liquefaciens*. In stages of more advanced decomposition in dogs and rabbits he found, in addition, *Bacillus candicans*, *Micrococcus candicans*, *luteus*, and *aurantiacus*. The fact that in different cases of sudden death, in a given stage of decomposition, under definite conditions as to time and temperature, in the blood of one and the same locality of the human cadaver, he found invariably the same micro-organisms, led him to believe that by further

<sup>1</sup> Vierteljahresschrift für gerichtliche Medicin, iv, 1892 sup., S. 9.

investigations a true chronology of decomposition may be established. However desirable such a result may be, it is not probable that even a complete knowledge of the bacteriology of cadaveric decomposition would ever materially simplify a process which is partially dependent upon the action of chemical solvents not related to bacterial growth, and is largely determined by accidental conditions, such as the state of the tissues at death, the temperature of the air, and the character of the surrounding medium.

The *Bacillus aërogenes capsulatus* has, according to the observations of Welch and others, a very distinct influence on the course of putrefaction. If a rabbit is killed shortly after the injection of 1 c.c. (16 minims) of a bouillon culture of this germ, the bacilli develop very rapidly after death, with an abundant formation of gas in the blood-vessels and organs, especially the liver. At temperatures of 18° to 20° C. (64°–68° F.) the vessels, organs, and serous cavities may be full of gas in eighteen to twenty-four hours, and at temperatures of 30° to 32° C. (86°–90° F.), in four to six hours when 1 c.c. (16 minims) of a bouillon culture has been injected into the circulation shortly before death. It has been suggested by Welch and Nuttall that in some of the cases in which death has been attributed to the entrance of air into the veins the gas found at autopsy may not have been atmospheric air, but may have been produced by this or other similar organisms (Sternberg).

It is a noticeable fact in experience with the postmortem changes referable to this germ that a large percentage of the cases indicate a probable infection through ruptured blood-vessels. Hemorrhage—from wounds, severe anemia, or postpartum—was a chief or contributing cause of death in 6 of 8 cases seen by the writer. From these cases and from the full collection of reports reviewed by Welch<sup>1</sup> it appears that an antemortem infection may often be distinguished from the postmortem form. When the infection occurs before death, the bacilli usually reach the general circulation very early, and the minute gas-bubbles and colonies of germs are found within a few hours after death in nearly all the tissues. When the growth of the germ is entirely postmortem, their dissemination is slower, and the larger vessels only, especially about the site of the wound or hemorrhage, are found to contain gas. Even in the latter case, however, the distribution of the germs is usually found to be wide-spread within eight or ten hours after death. The gas produced is composed largely of hydrogen and ignites readily.

**Putrefactive Discoloration.**—Among the earliest signs of decomposition is the appearance of a greenish discoloration in the skin of the umbilical and hypogastric or inguinal regions in bodies decomposing in the air, and of the midsternal region in bodies lying in the water. This and the later changes in the color of the skin are principally due to the disintegration of hemoglobin, which is soon dissolved from the red blood-cells, diffused throughout the tissues, and variously

<sup>1</sup> Journal of Experimental Medicine, vol. i, No. 1.



altered by the agents of decomposition. It is probable also that in entirely bloodless tissue a green discoloration may result from the decomposition of albuminous matter (Hoffman, Schrank).

The *first* greenish discoloration is usually observed on the *third day*, but when conditions are favorable for early putrefaction, it may appear before the end of the second day. Ordinarily the greenish color deepens and extends over the abdomen, so that by the *fifth day* the whole of the abdominal parietes is variously mottled, and similar patches are seen over the genitals, neck, back, and limbs. About this time the vessels become turgid with the fluid and gaseous products of decomposition, and the skin becomes tense and peculiarly mottled in appearance. After the *first week* the face is involved in the greenish coloration, while the parts first affected have gradually darkened to a reddish-brown tint, with occasional patches of dark purple. After the *second week* the entire body is uniformly discolored, the more advanced changes giving a dark brown or black color, the less advanced stages appearing greenish or purple. At any time during the first week the gases of internal decomposition may force fluid blood into the superficial vessels, producing a diffuse bright red color in the skin.

**Putrefactive Gases.**—Some of the most striking and peculiar changes in the cadaver are caused by the development of the gaseous products of decomposition in the gastro-intestinal tract, serous cavities, blood-vessels, and tissue spaces. According to Tidy, the gases formed in the stomach during life are often inflammable and contain considerable pure hydrogen, but very little sulphureted hydrogen, while postmortem decomposition produces sulphureted hydrogen in abundance as well as carbureted hydrogen, which is inflammable, and ammonia. After the first week of decomposition the offensiveness of these gases and the quantity of sulphureted hydrogen and ammonia gradually diminish, while carbureted hydrogen, carbonic oxid, and nitrogen are relatively increased and continue to be formed for months. When decomposition begins in the blood, the carbonic dioxid disappears and other gases are formed in this fluid (Falk).

The first effect produced by the development of gases is the **distention of the cavities**, hollow viscera, and tissues of the body. Cadavers at this period are therefore considerably increased in size. The skin becomes tense and elastic, and may crepitate under pressure. The natural folds and rugæ are obliterated, and the features are swollen and soon become unrecognizable. The bodies of newborn infants, at this time, have been mistaken for those of children a year old. Wherever the loose subcutaneous tissue is abundant, the skin becomes extremely distended, as in the scrotum, neck, groins, and axillæ. The specific gravity of the body is reduced, and cadavers lying under water usually rise to the surface.

A second effect produced by the development of gases is the **protrusion of viscera** or their contents. From the fourth to the eighth day, often earlier, the eyes usually become prominent, or may be forced well out of the orbits. The softened brain may be forced out of the cranial



openings or along the cerebral and jugular veins (Ogston). The tongue is early distended by interstitial gases and protrudes more or less from the mouth, an effect probably due in part to the distention of the thorax and neck. Frothy mucus is often forced from the bronchi through the nostrils, a condition which may sometimes be seen immediately after death from edema of the lungs. The fluid contents of the stomach may be forced from the mouth or may settle in the bronchi, where the presence of stomach contents ordinarily indicates death from inspired vomitus. Distention of the intestines results in a protrusion of the abdomen, may force out the contents of the stomach or bladder, and may cause the extrusion through the anus of several inches of the sigmoid flexure.<sup>1</sup> It is probable that gaseous distention is the cause of most of the cases of spontaneous movement of corpses demonstrated after burial. The postmortem expulsion of the fetus is probably due also, in the majority of cases, to this same cause.

As a common result of changes in the blood, vessels, and tissues of the body in the earlier periods, and of gaseous distention at a later stage, fluid effusions of considerable volume may occur in the serous cavities or in the tissues. Much of this serous effusion undoubtedly belongs to the period immediately succeeding death, when the effusions are usually of clear fluid. Transudations of considerable volume are not infrequently found at postmortem in cavities known to be comparatively free one or two hours before death. At other times the effusions occur only when decomposition and gaseous distention are present, in which case the effusions are blood stained and offensive. The peritoneal, pleural, and pericardial cavities may contain considerable quantities of this decomposing fluid, which may usually be distinguished from inflammatory exudates by the absence of pus and fibrin. Collections of blood-stained fluid are often found in these situations in asphyxiated infants, and when the onset of decomposition is rapid it may be very difficult to determine the true origin of the fluid. When gaseous distention has become extreme, the fluid blood is forced into the capillaries under considerable pressure, and the tendency toward transudation is greatly increased. The effect of this displacement of the blood in reddening the skin of decomposing cadavers has been mentioned. Collections of fluid and gas in the tissues are formed either in the substance of the muscles, where they are produced in part by the solvent action of lactic acid and digestive ferments, or in the intermuscular septa or in the subcutaneous tissues. Blebs in the skin are most abundantly produced in macerated bodies, especially those of still-born infants, in which the writer has seen them extensively developed in twenty-four hours. In the solid viscera the production of the gases and fluids of decomposition keeps pace with the process in other tissues, being most abundant in the liver and kidneys.

**Putrefactive Changes in the Blood.**—Of postmortem changes in the morphology of the blood little is definitely known. At the beginning of decomposition, or, under many conditions, much sooner,

<sup>1</sup> Harris, Hamilton, *Legal Medicine*, i, p. 100.

the red cells lose their hemoglobin, which diffuses through the blood-vessels, saturates the tissues, and is finally disintegrated, producing the various color changes noted in the skin. Within a period of two to three months<sup>1</sup> the blood loses its capacity to form hemin crystals, while the final destination of the iron contained in the blood-pigment is seen in the black discoloration of the skin and occasionally of the bones of cadavers exhumed years after burial. At the beginning of decomposition carbonic dioxid disappears from the blood (Falk). The clots in the blood-vessels are early dissolved. As to the exact process here concerned, Falk<sup>2</sup> states that a peptonization of the fibrin cannot be proved, but that the fibrin is first transformed into globulin and then dissolved by a process as yet undetermined. After losing their hemoglobin, the red cells become shriveled and are finally reduced to a granular detritus. They resist decomposition longer than the white cells. At an early stage of decomposition the nuclei of the leukocytes stain very faintly, the neutrophil granules disappear, and the cell body becomes fragmented and disappears.

**Changes in the Viscera.**—The effects of decomposition are seen in the changes in color and consistence, and in the obliteration of structural detail in the viscera, which are also the only means of judging grossly of the effects of vital inflammatory changes. The separation between postmortem and inflammatory changes in the viscera not only passes beyond the scope of gross pathology, but remains today one of the chief objects of microscopic investigation. It is, therefore, possible in this connection to give only the barest outline of the signs by which may be distinguished the early effects of visceral decomposition.

It is commonly stated that *putrefactive softening* affects an entire viscus, while *vital softening* is less general, a useful rule to which there is the exception that acute degeneration in a viscus, as in acute yellow atrophy of the liver, usually produces a uniform diminution in the consistence of an organ that is rather less marked than the putrefactive change. Putrefactive discoloration of viscera is more readily distinguished from inflammatory change by the diffuse nature of the stain in the one case, and the irregular effects of arterial and venous hyperemia in the other. Purulent and fibrinous exudates are never of putrefactive origin, but effusions of serum may occur after death; but when the latter result from decomposition, or any of them are mixed with the products of decomposition, they are deeply blood stained and fetid. The *obliteration of structural detail* is effected very early by decomposition, but is rarely so extensive when resulting from inflammation or vital processes. In general, in distinguishing between vital and putrefactive changes, it is essential to consider the probable condition of the viscera as determined by the cause of death and the circumstances affecting decomposition.

The length of time that the various organs resist decomposition differs widely, being dependent on the density and blood content of the

<sup>1</sup> Misuraca, Virchow's Jahresbericht, 1889, i, S. 488.

<sup>2</sup> Vierteljahresschrift für gerichtliche Medicin, 1889, S. 272.

tissue, and upon the ease with which they may be reached by the air or penetrated by bacteria or dissolving ferments. The viscera which early show the effects of decomposition are the gastro-intestinal tract, the liver, the spleen, and the brain.

The **stomach** is specially liable to suffer from postmortem and putrefactive changes on account of its usual content of fermenting food, digestive ferments, and bacteria, and its considerable blood-supply. It is usual to find the gastric mucosa entirely unfit for microscopic examination at periods when the other viscera are in good preservation. The self-digestion of the stomach is favored by the presence of active digestion at the time of death. A few hours after death the mucous membrane may have a smooth, glazed appearance from destruction of the superficial tubules, and from this surface the blood may be squeezed out of the open vessels. Complete perforation of the stomach may then result before any other viscera show signs of putrefaction, as recorded by Wibert<sup>1</sup> in a case of triple perforation of the stomach and diaphragm, the pleural cavity containing fluid food, without signs of inflammation in the pleura, and without evidence of putrefaction in any other viscus. The ordinary process of putrefaction begins to affect the stomach usually between the third and the eighth day, but may begin much earlier. The writer has seen the entire stomach of an infant darkly discolored and much softened six hours after birth and twenty-four hours after death *in utero*.

Beginning usually at the site of postmortem lividities and involving the entire wall of the stomach, dark red or green discolorations appear, gradually enlarge, most rapidly along the course of the vessels of the greater curvature, and coalesce over the whole surface of the organ, which is by this time much softened or perforated. Perforations and areas of necrosis due to irritant poisons may usually be recognized for considerable periods, by evidences of inflammation and by the location, color, and depth of the necrotic tissue. Some poisons, such as arsenic, may occasionally act as preservative agents on the stomach, in which case the original condition of the organ may be determined three or four weeks after death. It is important to remember that the stomach shortly after death may be found intensely reddened from arterial hyperemia, or darkly discolored from venous congestion, or variously stained by bile, or its wall doubled in thickness from edema.

The **intestines** are changed by decomposition in much the same way as the stomach, but less rapidly, and they are much less subject to self-digestion. The **esophagus** is a very resistant structure, recognizable after the stomach and intestines have become disintegrated. The **mesentery**, also, frequently persists after the intestines have been destroyed.

**The Liver.**—The first effects of decomposition appear so early in this viscus that the reduced consistence of the flabby “summer liver” is the usual condition of the organ found during warm weather, at autopsies conducted from twelve to twenty-four hours after death. Of the internal organs, the liver is usually the first to develop the gases of

<sup>1</sup> Annales de Hygiene, 1891, p. 82.



decomposition, which may render it emphysematous at the end of thirty-six hours, or much earlier when the *Bacillus aërogenes capsulatus* is multiplying abundantly. Later, the usual greenish discoloration appears on the convex surface, gradually deepens, and extends until the organ becomes uniformly black. One to two months or more are usually required to reduce this viscus to a puffy, structureless mass. The **gall-bladder** is rather more resistant than the liver, but bile-pigments may early and extensively diffuse through the adjacent tissue. The **spleen**, when swollen and hyperemic at death, decomposes rapidly, but when firm and comparatively bloodless, may long resist putrefaction.

The **brain** begins to decompose in the basal ganglia and dependent portions, where fluids naturally gravitate, and in the course of two or three weeks usually becomes nearly diffuent. Structural details have, however, been recognized after some months. In infants the brain very rapidly becomes softened, owing to its original soft condition, the readier access of air, and the frequency of effusions of blood and serum into the pia. It may be difficult to distinguish the "hortensia reddening" of acute encephalitis (Virchow) from postmortem discoloration.

The **trachea** and **larynx** are the first internal structures to show the discoloration resulting from putrefaction. In from three to eight days the mucous membrane of the larynx and adjoining portion of the trachea are found of a reddish-brown or dark green color.

The remaining viscera are less easily changed by decomposition.

The **heart** and **large blood-vessels**, in the absence of extensive pathologic changes, prove very resistant structures, and lesions, such as pericarditis, have been demonstrated at a period when other organs were far advanced in decomposition.

The **lungs** are usually partially preserved, and pathologic lesions are demonstrable in them, longer than with more cellular viscera, but the period of their preservation varies greatly. Tidy refers to 2 cases in which the lungs of children, after seven months' burial in a dry soil, were more decomposed than any other viscera, some of which may have been preserved by the presence of arsenic. In bodies submerged in water, at the end of the first month the lungs are usually very emphysematous and completely overlie the heart. Isolated bullæ appear in the pleura as decomposition begins. After three and a half months the lungs are collapsed and the pleural cavities contain reddish serum (Devergie). The **diaphragm** is usually distinguishable after six months.

The **kidney**, if normal or sclerosed, resists decomposition longer than the liver, but if acutely inflamed at death, its structural details are obliterated very rapidly.

The **bladder**, if contracted and empty, is one of the most resistant structures, but decomposes rapidly if it has been distended and inflamed. Some importance attaches to the fact that in the early stages of decomposition of its mucous membrane there is usually an albuminous exudate into the urine, producing a *postmortem albuminuria*, demonstrable in most cases within forty-eight hours after death.



The **uterus** has repeatedly been found in a state of fair preservation when all other viscera were indistinguishable. Its persistence is rather less uniform in children, but in adults not only the sex of the body, but the question of a recent pregnancy, has been determined after long periods, when the skull and long bones were extensively bared and the ligaments separating.

**Conditions Influencing Putrefaction.—Temperature.**—Bacterial growth and putrefactive processes are arrested by temperatures approaching the freezing-point or considerably below the boiling-point. The most favorable temperature is between 70° and 100° F., and variations above or below these limits very promptly affect the progress of decomposition in the recently dead body.

**Moisture.**—Complete dryness arrests bacterial growth, while putrefactive species are most active in very fluid media. It has been shown that the denser a viscus, the less rapid is its decomposition. Edematous or inflamed tissues putrefy early. Bodies that have lain in water and are subsequently exposed to the air decompose with extreme rapidity, although continued submersion, by the exclusion of air, delays putrefaction. Ordinarily, the tissues contain sufficient moisture for rapid decomposition, but it has been shown by Dupont<sup>1</sup> that bodies exposed to the air lose moisture and weight at the rate of 7.7 grams (120 grains) per kilo each day. With other conditions unfavorable for putrefaction the body may become so desiccated that decomposition ceases. Instances of decomposition thus arrested are seen in the long preservation of the bodies of travelers in the Sahara Desert. The excessive heat of the sun, aided by a very dry atmosphere, has here a distinct preservative influence. It will generally be found that moisture is more important for decomposition than either heat or air, and that slight variations in this factor have a controlling effect on the rapidity of putrefactive processes. It has often been observed that moist air, even if cold, is more favorable to decomposition than a warm but dry atmosphere.

The **access of air** promotes putrefaction by carrying moisture, bacteria, and oxygen to the cadaver. Of all gases, decomposition proceeds most rapidly in oxygen, especially when it is mixed with nitrogen, as in the air, and the comparative absence of oxygen greatly retards decomposition. For this reason deep burial in the earth or water, the use of leaden coffins, or saturation of the air with turpentine, which absorbs oxygen, insures a temporary preservation of the body. Moist, hot, and stagnant air is the most favorable medium for decomposition.

**Time and Place of Interment.**—Bodies lying in the air for some time not only suffer from the action of oxygen, but attract the microorganisms and insects of the air, so that decomposition is hastened and its character permanently established. Orfila states that in summer a body exposed for five or six days before burial undergoes in a month as much change as it would have suffered at the end of seven months had it been interred at once. Burial in a shallow grave, without clothing or coffin, does not exclude oxygen or the bacteria of the soil, and decom-

<sup>1</sup> Virchow's Jahresbericht, 1891, i, S. 510.

position is therefore rapid. The most favorable soil for decomposition is a moist, porous loam, moldy or impregnated with animal or vegetable matter. The occurrence of *adipocere*, however, is favored by these conditions, the formation of which completely transforms the usual course of putrefaction. The most favorable soil for the preservation of the body is sand, gravel, or clay, in which moisture is deficient and the desiccation of the body rapid. In such a soil, in a deep grave, and in a hermetically sealed leaden coffin, the body may long remain in remarkably good preservation. Reinhard<sup>1</sup> examined many bodies exhumed in Saxony, and found that in sand or gravel the destruction of the soft parts, in children, was complete in four years; in adults, in seven years. In clay the process was somewhat slower. Most remarkable is the preservation of bodies buried in peat-bogs, from which cadavers have been recovered in an excellent state of preservation after the lapse of a century.<sup>2</sup>

**Age and Sex.**—Under similar conditions the bodies of children decompose more rapidly than those of adults. Corpulent bodies decompose more rapidly than the lean and emaciated. There is no evidence to show that the process of decomposition does not proceed with equal rapidity in both males and females; any difference that might be noted depending upon accidental circumstances and not upon the sex. The female body usually containing more adipose tissue, is more readily converted into *adipocere*.

The **cause of death and the condition of the body at death** have a very prominent influence upon the course of decomposition. Some of the factors here concerned have already been mentioned. Any disease which leaves the tissues inflamed, edematous, degenerated, or, as is often the case, infected with bacteria, will be followed by rapid decomposition. Such are the acute infectious diseases and chronic disease terminating in dropsy or septicemia. The most rapid progress of decomposition in the writer's experience was noted in the body of a woman dying from postpartum hemorrhage after treatment by large infusions of salt solution. When sudden death occurs in the absence of fever, infection, or edema, and when chronic diseases terminate with emaciation and anemia, the conditions are less favorable for bacterial growth, and putrefaction is less rapid. The presence of certain poisons in the body which act as antiseptics may interfere with bacterial growth and retard putrefactive changes. Instances of this sort have been seen after death from arsenic, antimony, chlorid of zinc, phosphorus, and some other mineral poisons, and, according to Devergie, after poisoning by chloroform, strychnin, and carbonic oxid.

**Cadaveric Changes in Bodies Embalmed.**—The progress of postmortem decomposition may be arrested permanently by the intravenous injection of the embalming fluids used by undertakers. When the fluids are injected very soon after death, as usually occurs, decomposition may be entirely prevented and the tissues may be found in excellent preservation for months, and probably years, after burial.

<sup>1</sup> British Medical Journal, 1883, p. 267.

<sup>2</sup> Lancet, 1873, p. 817.

The arrest of decomposition does not, however, interfere with the effects of desiccation, a process which may lead, after the lapse of years, to the complete mummification of the corpse. When the work of the embalmer has been thoroughly done, one may expect to find that the only changes in the internal viscera of the embalmed and properly buried corpse are those of *desiccation*, while the degree of these changes will depend upon the period that has elapsed since death and the character of the surrounding soil. The ravages of insects and bacteria under these circumstances appear to be confined to the skin, the eyes, and the more accessible mucous membranes.

The following abstract from the notes of a case in which the autopsy was performed six months after death will serve for illustration. The body of a child five years of age had been embalmed by the intravenous injection of preserving fluids, and buried in a dry gravel, in a wooden casket, surrounded by a casing-box of pine. The outer box was found quite dry, the casket was moist, but no molds were seen inside or out. Running from the foot of the casket was a blood-stained line which had soiled the coverings of the casket and the bottom of the box. The internal coverings were moist, the clothing of the cadaver much decayed, especially over and under the trunk.

Covering the clothing and the skin of the entire body was a thick layer of brownish dust in which were many small white insects, the size of a pinhead, and their small oval eggs. The dust, composed of the insect excreta, had produced a brownish discoloration of the skin, especially of the face, which was nearly black.

The body was rigid, the skin much desiccated, and over the fingers almost hornified. Nails and hair were firm. Teeth very loose. The orbits contained only a little black semifluid matter, but the lids and lashes were intact. The cheeks, chin, nose, and features were apparently natural and not shrunken.

**Internal Examination.**—The tissues of the neck were moister than elsewhere, and on the right side the tissues were evidently edematous. The lymph-nodes in both sides of the neck were much swollen. The tissues of the posterior pharyngeal wall were very dark, but not necrotic, and at one point a small ragged opening was noticed. Behind the right tonsil was a large ragged cavity, partly empty, but containing in its deepest portions some bright red clotted and fluid blood. In the internal carotid artery was found an irregular opening communicating freely with the above cavity, the cause of death having been hemorrhage from this vessel.

The *tonsils* showed numerous deep excavations from a previous croupous inflammation, but no ulceration or necrosis. The mucous membrane of the nares was in an advanced stage of decomposition, the periosteum was loose, and the vomer free from its articulations. The *lungs* were very firm, the pleura desiccated and shiny. In the pleural cavities were 4 ounces of yellowish, transparent fluid. Numerous lobules were sharply marked off by their dark red color, due to inspired blood. *Heart.*—Hard, tightly contracted. Right side contained a dark clot; left side entirely empty. *Liver.*—Much desiccated superficially and very firm; color light leaden; markings indistinguishable. *Gall-bladder* was contracted, empty. *Spleen.*—Moderately enlarged, capsule smooth, hard, and dry; section dark gray; Malpighian bodies light gray and distinct. *Kidneys* were very firm, dry; markings regular and distinct. *Esophagus* was contracted and extremely hard. *Stomach* was tightly contracted, firm, mucous membrane perfectly preserved and thrown into prominent rugæ; contents a little semifluid brownish matter. *Intestines.*—Peritoneum shiny, dry, light colored, like paper, mucous membrane intact. The *large arteries* were hard, dry, shrunken; the *veins* firm, containing a little clotted blood, in places decolorized and gelatinous.

**Microscopic examination** showed all the tissues examined, except some of the swollen cervical nodes and the hepatic cells, to be very well preserved. Colonies of cocci were demonstrated in the wall of the abscess.

From this case it appears that wherever the preserving fluid was carried by the blood-vessels decomposition was completely arrested. The single exception was the liver, while the destruction of the eyes may be referred to the imperfect access of fluid to these organs. The



ravages of the insects were entirely superficial to the epidermis, a fact which suggests that if the skin had been treated with some irritant antiseptic, such as corrosive sublimate, the discoloration resulting from the excreta of the insects might have been avoided. The insects belonged to the species *Tyroglyphus*, and promptly perished upon exposure to dry air.

Unfortunately, the methods of embalming used by undertakers are by no means uniform. The variety of preserving fluids on the market is considerable, and their action is not always reliable. In many localities the operator is content to inject a little of the fluid into the serous cavities instead of into the blood-vessels, in which case it is impossible for any of the viscera to become thoroughly impregnated, while the muscular and nervous systems remain entirely unaffected. It is not to be supposed, therefore, that in every case in which the body is said to have been embalmed the state of preservation will be found as perfect as in the case described.

**The Course of Putrefaction in Water.**—The process of decomposition in water is more uniform than in air, but is subject to wide variations. Submersion in shallow, warm, and stagnant fresh water retards putrefaction little or not at all, while after deep submersion in cold salt water bodies have been found well preserved after many years. Hoenig<sup>1</sup> reports the recovery of several well-preserved bodies that had been thrown into a salt well after the battle of Salzburg, forty-one years before. About the fourteenth day, or earlier in summer, and after six weeks in winter, the development of gas usually brings the body to the surface, where it decomposes more rapidly. It may then sink and rise a second or a third time, as determined by the volume of confined gases.

The observations of Devergie at the Paris morgue on the course of putrefaction in submerged bodies are widely quoted, and are claimed by this investigator to offer reliable data from which to calculate the length of time that bodies have remained in the water. The following descriptions apply to bodies submerged during cold weather and in fresh water. In warm weather the course of decomposition was found to be more irregular and very much more rapid.

During the **first four or five days** rigidity may persist. The skin of the tips and sides of the fingers is whitened.

At the end of **one week** rigor mortis is absent, the palms of the hands and soles of the feet are whitened. The skin of the face is softened and slightly bleached.

From the **seventh to the twelfth day** the backs of the hands and the face are bleached.

At the **end of two weeks** the face is swollen and shows a few red spots. There is a greenish discoloration over the midsternal region. Except on the dorsum of the feet the skin of both hands and feet is white and slightly wrinkled.

**One month:** The face is swollen and reddish-brown in color; the eyelids, lips, and neck are green. The front of the chest presents a spot 6 inches in diameter, brown in the center and greenish at the edges. The skin is much wrinkled. The scrotum and penis are distended by gas. The lungs are very emphysematous.

**Two months:** The face is extremely swollen and brown. The skin of the abdomen and limbs remains natural; elsewhere it is variously discolored and often

<sup>1</sup> Berliner klinische Wochenschrift, 1890, p. 1212.



detached. The nails and hair may easily be detached. The veins are empty of blood and filled with gas. The right ventricle, if previously gorged with blood, is of jet-black color.

**Two and one-half months:** The skin is everywhere discolored, and with the hair and finger-nails completely detached. The abdomen is much distended. The cheeks, chin, axillæ, breasts, and inner parts of the thighs may be partly converted into adipocere.

**Three and one-half months:** The features are largely destroyed, and recognition is impossible. The skin of the hands and feet and in many other spots has disappeared. The lungs have collapsed, and the pleural cavities contain reddish fluid. The face, upper part of neck, and axillæ may be partly saponified.

**Four and one-half months:** The skull is bare, and the skin of the face, neck, and inner parts of thighs is destroyed or saponified and incrustated with calcareous salts. The anterior portions of the brain may show traces of adipocere.

**After four and one-half months** it becomes impossible to follow accurately the stages of decomposition.

**Calculation of the Time of Death from the State of the Cadaver.**—It will readily be seen from the great variety of conditions thus far detailed as markedly affecting the rate of putrefactive changes that the difficulties in the way of determining the time of death from the examination of the dead body are always very great and often insurmountable. Even during the first few hours after death a consideration of the internal temperature, which is the most reliable guide, gives very imperfect data. At later periods the stage of decomposition in which the body is found is much less definite evidence of the time that has elapsed since death. The greatest reliance may be placed, as claimed by Devergie, on the uniformity of putrefactive changes in bodies immersed in cold water. Under other conditions, while decomposition in the majority of cases follows the chronologic order of Caspar, given elsewhere, entirely contradictory results are frequent. Nearly all observers are therefore agreed that it is usually impossible and unwise to attempt to calculate, even within wide limits, the time of death from the stage of decomposition in the cadaver.

The following reports will serve to emphasize the wisdom of this conclusion. Caspar once examined the bodies of 14 soldiers, of the same age, living under the same conditions, dying at the same time by gunshot wounds during the cold weather of March, and lying in the same dead-house for two days, and yet in no 2 cases did he find similar signs of putrefaction. The same author refers to the instance of an old couple, between fifty and sixty years of age, whose bodies were discovered, four days after death from carbonic oxid poisoning, in the month of November. In the body of the man, who was thin, the skin of the abdomen and back was green, and the mucous membrane of the trachea was brownish red and fetid, while the body of the woman, who was very fat, showed no traces of decomposition. Tidy has collected numerous cases showing that advanced putrefaction may be found as early as eight hours after death, or its onset may be delayed several days. His cases show equally well that the soft parts may be destroyed within a year, or remain well preserved for many years.

There remains, however, a large class of cases in which the course of putrefactive changes is more gradual and uniform. From prolonged

observations on bodies exposed to the air or buried in the ordinary manner, conditions in which he believes decomposition to proceed with about equal rapidity, Caspar has prepared the following series of descriptions, by which may be drawn inferences as to the time of death:

**One to three days:** A greenish discoloration appears in the skin at the center of the abdomen. The eyeballs are distinctly softened.

**Three to five days:** The greenish discoloration of the abdomen has deepened and extended to other parts of the body, spreading in the following order: groins, genitals, breast, face, neck, upper and lower limbs.

**Eight to ten days:** The superficial discoloration has become more intense, and in the areas first affected there may be a slight reddish or brownish tinge. The blood-pigment has extensively diffused through the walls of the cutaneous veins, plainly outlining their course in dark red streaks, which later coalesce, producing a peculiar marbled appearance. Gaseous decomposition has begun in the tissues, viscera, and cavities, and the abdomen is distended, the face swollen, and the skin everywhere puffy. The cornea has sunken and is concave. The *sphincter ani* is relaxed.

**Two to three weeks:** The skin is everywhere discolored with green, brown, or black patches. The epidermis is detached in places or is raised into blebs, filled with reddish fluid. The hair and nails are readily separated. The body is uniformly swollen from gaseous distention. The eyelids, lips, nose, and cheeks are so swollen and discolored that the features are unrecognizable.

**Four to six months:** The decomposed walls of thorax and abdomen are ruptured, and the viscera are partially extruded or exposed. The sutures of the skull are loosened. The ligamentous attachments are loosened, and the long bones separate at the joints. The viscera are reduced to ill-defined pulpy masses.

At more advanced periods the stages of decomposition hardly admit even of this general description.

During the **second year** the soft tissues of the body usually become dry, shrunken, and brown or black. At almost any period after a few months, most frequently after the first year, hard white crystalline deposits of phosphate of lime may be found on the mucous membrane of the stomach or on the surfaces of other soft viscera. Under favorable circumstances nearly the whole body may be saponified.

After **four years** it is seldom possible to distinguish the separate viscera. After **seven to ten years** the soft parts have usually disappeared. Finally, the long bones only may remain, the short and flat bones, the base of the skull, and vertebræ having crumbled into powder. The bones of bodies buried in peat-bogs have been found to be entirely dissolved, while the soft parts remained in a good state of preservation. The hair, bones, and especially the teeth are the most nearly indestructible portions of the body.

**Determination of the Time of Death from Examination of Stomach Contents.**—In forensic cases the question occasionally arises as to the possibility of determining the time of death from the examination of the stomach contents with relation to the state of digestion. The answer to this question may be of the utmost importance in connecting the accused or other individual with the death under investigation. Under optimum conditions of acidity of the gastric juice and maintenance of a certain degree of heat in the dead body, digestion will proceed in the stomach and bowels after death even up to the point of complete digestion, even if the individual be killed immediately after eating. However, the expert knows nothing as to the condition of the gastric juice of the dead person and cannot, therefore, state positively that any appreciable digestion would have taken place in the stomach during life. If digestion be complete, one is justified in assuming that a period of at least two or three hours has elapsed since the meal was eaten.

In a case investigated by Haines and Hektoen,<sup>1</sup> the stomach was found to contain a large amount of blood (which had flowed into it from the shooting through of the large vessels of the neck) mixed with considerable amount of completely digested food. It is clear, in this case, that the shooting must have occurred after digestion was complete, as no digestion would have gone on after the blood had neutralized the acid of the gastric juice. If, on the other hand, the gastric juice be relatively inactive, either from disease or from the introduction of neutralizing material soon after a meal be eaten, little or no digestion would be noted and nothing could be stated as to the time of death of the individual. It is evident, therefore, that a direct answer to the above question must be given in a very guarded manner. Occasionally it is possible to give a positive answer, one way or another, but usually nothing of a definite nature can be determined as to the time of death from the estimation of the state of gastric digestion.

**The Entomology of the Cadaver.**—During the past decade and earlier there have been recorded a considerable number of observations on the fauna of graves, and the facts elicited have given increased interest and importance to the study of the higher forms of animal life supported by the cadaver.

Among the earliest forms of animal life to be found upon the unprotected dead body must be reckoned the maggots which sometimes make their appearance a few hours after death. The summer season and the presence of external wounds improperly cared for are usually the only necessary conditions for their growth. The fact that these and other forms derived from the air are more abundantly found upon bodies exposed to the air has sometimes led to the conclusion that bodies in which the evidences of their ravages were distinctly apparent years afterward had decomposed in the air for some time before interment in the earth. Yovanovitch<sup>2</sup> gives a review of the existing literature and a description of 2 original cases, and concludes that the study of the entomology of the cadaver can, with comparative precision, determine the time that the body has been dead, the season of the year when death occurred, whether the body up to the time of its discovery had remained in the same locality, whether the individual had died in the city and was buried in the country, or vice versa, and many other circumstances attending the death.

Megnin,<sup>3</sup> in one of his recent studies, explains many of the conditions affecting the growth of insects in the cadaver. According to his observations, the inroads of insects occur in a regular sequence, according as the body by its odor attracts the various forms or furnishes a suitable pabulum for their existence. Before decomposition has fairly begun the cadaver attracts certain flies of the species *Curtonevra* and *Calliphora*. After three or four days, when the odor of decomposition is manifest, it attracts flies of the species *Lucilla* and *Sarcophaga*. After

<sup>1</sup> Personal communication.

<sup>2</sup> Thèse de Paris, 1887, cited in Virchow's *Jahresbericht*, 1888, S. 467.

<sup>3</sup> *Bulletin de l'Academie*, xxxii, p. 34.



three or four months the fat of the cadaver is attacked by species of Coleoptera and Lepidoptera. After eight months a new species of fly and a variety of Coleoptera are found, such as commonly subsist upon decaying cheese. When the soft parts have been converted into a semifluid mass, a fifth group of flies, Ophera, Phora, and Tyreophora, is found.

From eighteen months to two years beetles, of the species *Silpha* and *Hister*, and some moths, absorb the moist and soft remains. In the third year insects which subsist upon dry tissues, such as the skin and fascia, principally of the variety *Anthemis*, make their appearance. Finally, after the fourth year, there may be seen beetles, of the species *Tenebrio* and *Plinus*, which subsist upon the detritus left by previous insects, and consisting principally of their chrysalids and excrement.<sup>1</sup>

Other investigators have not completely substantiated this chronologic table of Megnin. Laboulbère<sup>2</sup> finds that the exact time and order of the appearance of these groups are modified by the season of the year, the size of the cadaver, and the locality where it lies. It would appear, therefore, that the entomology of the cadaver depends upon the stage and progress of putrefaction, and as this has been shown to be a variable process, the study of the insect life of the cadaver becomes a very intricate subject, and, requiring as it does, the services of an expert entomologist, this interesting inquiry can rarely be pursued and can at best serve only as corroborative evidence of the period of death. Nevertheless, in so far as it aids the explanation of the process of decay in the cadaver, it is a distinct advance in our knowledge.

**Adipocere.**—In a considerable proportion of bodies buried in moist earth or submerged in water the course of decomposition and destruction of tissue will be interrupted by the formation in the tissues of a whitish, solid, soapy substance, called *adipocere*. The formation of adipocere represents a true saponification of the fat contained in the tissues. It is found on analysis to contain either calcium or ammonia, in combination with the fatty acids—oleic, palmitic, and stearic.

In its **physical properties** adipocere is a hard, brittle, nearly structureless mass, with an offensive odor. When containing calcium it is whiter than when formed with ammonia, but it may be secondarily discolored yellowish or brown. It is lighter than water, melts at 200° F., giving off ammonia, and after incineration leaves an earthy residue. Adipocere is a very permanent body, entirely resisting the ordinary agents of putrefaction, and has been found by Karlinski to be free from bacteria when the surrounding tissues were swarming with putrefactive organisms. While usually entirely structureless, Kratter has observed that when this substance replaces muscle tissue there may be faint indications of the striations of the muscle-fiber to be detected in the adipocere.

The formation of adipocere requires essentially a tissue containing fat, and setting free fatty acids and an albuminous tissue, which, by

<sup>1</sup> See Megnin, *La Faune des Cadavres*, Paris, 1894.

<sup>2</sup> *Ibid.*



putrefaction, develops ammonia. The fatty acids are readily supplied from the adipose tissue of the body, and it is a well-established fact that the transformation into adipocere is most complete in very fat bodies. It has long been a matter of dispute whether fatty acids may be developed from muscle and other tissues in which the quantity of fat must usually be small, and it has been claimed that the apparent saponification of muscle is correctly explained by the destruction of the muscle tissue and the subsequent flow of fluid fat into the spaces thus emptied. But in addition to the fact that most tissues contain more or less fat, and that during life they are subject to fatty degeneration, which is a frequent result of fatal disease, it has been shown by Voit and Bergeat<sup>1</sup> that fatty acids may develop in muscle tissue that has been placed in lime-water to prevent bacterial growth. This observation greatly increases the probability that muscle tissue may be partly transformed into and not merely replaced by adipocere. This view is now generally accepted, although so good an authority as Hoffman has been of the contrary opinion. The transformation of muscle substance into fat and adipocere is, however, in strict accordance with numerous other examples of the production of hydrocarbons from nitrogenous principles of the animal body. The ammonia necessary for saponification results from the decomposition of the nitrogenous elements of the body.

Hoppe-Seyler regards the formation of adipocere as the result of the action of a special ferment.

The occurrence of adipocere is subject to the same wide variations as are the other processes of putrefaction. The most favorable conditions for its formation are found in the bodies of fat and young individuals, and in bodies immersed in running water. The most complete transformation into adipocere is seen in burial-grounds where the soil is moist and where a large number of bodies have been placed in close proximity to one another. It is rarely seen in bodies buried in sand or gravel. Of the different parts of the body, those first affected are naturally the tissues and organs containing the most fat, as the subcutaneous tissues, the breasts, cheeks, kidneys, and, later, the muscles.

The time required for the formation of adipocere is also variable. Complete saponification, according to Devergie, requires at least one year when the body lies in water, and three years when it is buried in the earth. Caspar states that any considerable formation of adipocere requires at least three months in water or six months in the earth.

Tidy refers to evidence that adipocere may form in small quantities as early as six weeks, or even four weeks, after submersion. His cases also include the complete saponification of the body of an infant after six weeks' submersion, the extensive formation of adipocere in a body buried four months in a dry soil, and the remarkable case of Billroth's, in which the entire body of an extra-uterine fetus, completely transformed into adipocere in the abdomen of the mother, was removed by laparotomy.

<sup>1</sup> *Münchener medicinische Wochenschrift*, 1888, S. 518.

# SUDDEN DEATH

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THE complete scope of the medicolegal conception of sudden death is perhaps best, though imperfectly, seen in the service of coroners of large cities who are expected to investigate the causes of death in a large variety of cases of which little is known except that the subjects were "found dead."

Of the deaths thus encountered, the larger proportion, resulting from violence or poisoning, are elsewhere considered, the present section being concerned with the natural or internal causes of sudden death.

The classification of sudden deaths must, for the present purpose, include many instances in which the pathologic process has not been extremely acute or entirely free from pronounced symptoms, and in which the death could not have been regarded as sudden had the patient been under the observation of a physician. There is, for illustration, little real similarity between the death of a young woman overcome by fatal syncope on the floor of a ball-room, and that of a street-rounder who finally drops dead after struggling for days against an extensive pneumonia. Yet both are equally proper subjects for legal inquiry, and on account of the rapidity of the fatal terminations both must be regarded as examples of sudden death.

The old classification of Bichat of the modes of death, as beginning at the *heart by syncope*, or at the *head by coma*, or at the lungs by *asphyxia*, was the natural outgrowth of the teachings of Aristotle, Morgagni, and Galen, and was the first attempt to recognize the order in which the different organs and systems were involved in the process of disease and the series of events through which certain lesions must prove fatal.

Death is, however, rather infrequently the result of an exclusive affection of the circulatory, the respiratory, or the nervous systems, and it seems much more logical at the present day to discuss the causes of death in connection with the viscera principally involved in the lesion.

Yet even such a scheme can necessarily serve only a temporary purpose, for the continued investigation of organic disease is constantly enlarging and readjusting ideas as to the relative importance of the various visceral lesions associated in these diseases. In the present state of the knowledge of pathology one rests content when some morphologic change in the structure of a viscus, which it is the custom to call a *fatal lesion*, is discovered. Of the links in the chain which con-

nects this lesion with the cessation of the complex process of life one is for the most part in ignorance, and the inability to point out the essential relation between change of structure and alteration of function in a cell or viscus renders it often a matter of conjecture to decide what constitutes a fatal lesion or which of many lesions is the essential cause of death. For instance, sclerotic kidneys are sometimes found at autopsy as an unimportant and secondary lesion in persons dying without renal symptoms, although this lesion, under many circumstances, would be at once accepted as the cause of death. Yet in neither case would the mere presence of connective tissue in the kidney give an explanation of the death of the patient. Even more difficult is the problem when dealing with cases of death from some poisons which leave no morphologic evidence yet demonstrated of their fatal action. So that it must be confessed that in some cases it is impossible to find any trace of the manner or cause of death, and in other cases to demonstrate any necessarily fatal result of existing lesions.

Such considerations may serve to indicate the wide gap that exists in the knowledge of the relation of structural changes in viscera and the phenomena of life, and until this gap has been bridged over no final plan of classification of the causes of death can be constructed. Nevertheless it will not be well to retain a scheme which recognizes only the crudest notions of symptomatology and ignores the present knowledge of the essential pathologic basis of disease.

## CONSIDERATION OF THE VISCERAL CHANGES LEADING TO SUDDEN DEATH

**Heart and Blood-vessels.**—Of the viscera in which organic or functional disturbance leads to sudden death, the heart and blood-vessels are those most frequently affected. In 1000 deaths reported by Westcott,<sup>1</sup> of which 303 were entirely unexpected, 210 resulted from syncope, 64 from asphyxia, and 29 from coma.

Organic disease of the heart, frequently, though in a smaller percentage than is often believed, terminates in sudden and unexpected death. **Valvular lesions of the heart** usually induce a well-marked train of symptoms ending in gradual asthenia, less commonly in fatal suffocative attacks. **Aortic stenosis** and **insufficiency**, however, not infrequently terminate in sudden death when the general condition of the patient gives little suspicion of such danger. Sudden muscular exertion or extreme mental emotion is the usual immediate cause of the fatal attack. Other forms of valvular disease, even without special complications, may occasionally end in sudden death.

**Cardiac thrombi**, arising usually from endocarditis, may gradually become elongated or detached, and lodged in the orifices of the heart, when the disturbance of the heart's action which ordinarily results from their presence instantly becomes extreme and proves rapidly fatal. When portions of vegetations of the diseased valves are lodged as

<sup>1</sup> British Medical Journal, Oct. 17, 1891.



**emboli** in the arteries of the brain, death may result very soon, although the usual course in such cases is more prolonged. When the coronary arteries are similarly occluded, death may be more rapid, a fact of which the complete experimental proof has been recently furnished by Porter.<sup>1</sup> **Stenosis of the coronary arteries** may lead to sudden death under three somewhat different clinical aspects: (1) Sudden occlusion of one large coronary artery by thrombosis or embolism may so greatly obstruct the neuromuscular mechanism as rapidly to inhibit the heart's action and lead to sudden death. Complete experimental proof of this fact in animals has recently been furnished by Porter. (2) Sclerosis of the coronary arteries is the main lesion observed in some cases of sudden death with symptoms of angina pectoris. (3) Gradual stenosis of the smaller arterial branches usually leads to fibrosis and atrophy of the heart muscle, but when a large artery is rather rapidly occluded anemic infarction of the muscle occurs, followed in a few hours or days by softening and rupture. The history in such cases is characteristic. At the time of the infarction there is sharp pain in the precordium, dyspnea, and even collapse, from which the patient recovers only to die suddenly a few hours or days later when rupture of the heart occurs.

**Interstitial or fatty myocarditis**, with or without valvular lesions, is the usual form of heart disease terminating in sudden death. It is probable that alterations in the nervous apparatus of the heart are partly concerned in the sudden failure of the heart so frequently seen in these conditions (Kuszenow).<sup>2</sup> In addition to the fatty degeneration of the heart muscle associated with myocarditis there may be a marked **increase of the subpericardial fat**, which encroaches on and infiltrates the heart muscle and may lead to extreme atrophy of the walls, especially in the auricles. This condition is usually found in fat persons who suffer from palpitation and dyspnea, and who, having some violent disturbance of the circulation, may suddenly die. Brouardel<sup>3</sup> has observed this condition in poorly nourished children who died from the effects of the cold bath.

**Tuberculous myocarditis**, usually in association with slight or advanced pulmonary tuberculosis, may be an unexpected discovery at autopsy in case of very sudden death occurring in various stages of phthisis, and has been noted without the pulmonary lesion (Kolisko, Hoffman).

**Rupture of the heart wall** may suddenly terminate an old cardiac lesion, the rupture being almost invariably preceded by myocarditis, endocarditis, or anemic infarction. Even rupture of the heart is, however, not always immediately fatal, life being prolonged for several hours when the blood takes a circuitous course through the cardiac muscle before reaching the pericardium. As in the case of rupture of aortic aneurysms, anemia is not the sole cause of death, which is here due principally to distention of the pericardium and pressure upon the

<sup>1</sup> Journal of Experimental Medicine, 1896, No. 1.

<sup>2</sup> Virchow's Archiv, Bd. cxxxii, S. 1.

<sup>3</sup> Death and Sudden Death, p. 126.



right side of the heart. **Rupture of a valve** or a **chorda tendinea** usually causes very urgent symptoms, and has been known to result in almost instant death (Councilman).<sup>1</sup>

In a considerable class of cases in which the pathologic findings include myocarditis, endocarditis, sclerosis of the coronary arteries, atheroma of the aorta, and changes in the cardiac plexus of nerves, sudden death occurs with the peculiar complex of symptoms called **angina pectoris**.

**Adherent pericardium** has been the sole pathologic condition recognized in many cases of sudden death. Whether this condition alone is capable of inducing a fatal issue may be doubted, and it is the opinion of the best authorities that adherent pericardium cannot stand alone as a cause of death. But there can be no doubt that adherence of the pericardium may be very early followed by changes in the heart muscle and by chronic congestion of the viscera, the combination of which, under favorable circumstances, such as violent exertion or acute disease, has resulted in sudden death. The demonstration of such secondary changes may, however, escape detection by the naked eye and require a careful microscopic examination.

In addition to the organic diseases of the heart just named in which adequate pathologic changes may be demonstrated, sudden death occurs with symptoms of cardiac failure in a considerable number of cases in which no satisfactory structural changes in the heart have been discovered, and which must be referred to **functional disturbance of the heart's action**.

**Shock**.—Usually in young or in old and enfeebled persons, after severe injuries, with or without hemorrhage, sometimes after surgical operations, sudden death may occur in the absence of any satisfactory pathologic basis that has yet been discovered, and with a somewhat peculiar combination of symptoms called *shock*. The pathology of this condition is imperfectly understood, but is partly explained by the well-known experiment of Galtz, who, by repeated blows on the abdomen of frogs, produced complete arrest of the heart and dilatation of the abdominal vessels to sixteen times their usual capacity. After passing through many phases of interpretation, experimentation, and study, by many observers, this original conception of the essential element in shock has not been definitely altered. Recent studies have served chiefly to emphasize certain complications of surgical shock, such as hemorrhage, fat embolism, and disturbance of the respiratory mechanism (Cannon). It would thus appear that in some cases, at least, shock is essentially a vasomotor and cardiac paralysis. After death from this cause the autopsy may reveal nothing but an abnormal blood content in the abdominal veins, a condition of which it is rather difficult to judge.

**Syncope** is a term applied to a condition closely allied to shock, both presenting in a very similar degree cardiac weakness and arterial anemia. The indefinite character of both terms, *shock* and *syncope*, renders it difficult to determine in every case whether death should be

<sup>1</sup> Boston Medical and Surgical Journal, 1893, p. 457.

referred to one or to the other, and often reduces the decision to a matter of conjecture, as the following case will illustrate: Deutsch<sup>1</sup> reports the sudden death of a woman, twenty-one years old, after one minute's submersion in cold water for baptism. Immediately after the ceremony the girl sank down unconscious in the dressing-room and died. The autopsy revealed no organic lesions, and death was attributed to the cold water and the mental excitement of the ceremony. It would be difficult to determine in this instance whether death should be assigned to shock from the cold water or to simple heart failure from the same cause and the coincident mental excitement. Such events are probably limited to subjects of status lymphaticus.

It would be strictly in accordance with the present application of the term to attribute to *syncope* the sudden death of patients convalescent from pneumonia, who have been known to fall dead when making considerable muscular exertion, as in sitting upright in bed. Here the combination of cardiac weakness and cerebral anemia is sufficient to induce death, and the element of shock cannot be said to enter.

Probably a large proportion of the cases of fatal syncope are referable to organic changes in the heart and arteries, which manifest themselves only under the influence of some peculiar exciting cause. The autopsy may then reveal the organic basis of a disturbance which may have appeared purely functional. At other times fatal syncope occurs in the absence of any anatomic change as yet demonstrated in the heart, blood-vessels, or nervous system, and the results of postmortem examination thus far are entirely negative. It is even reported that muscular exertion and mental emotion alone have led to sudden death of persons in sound health. To any such supposition an emphatic protest must be entered, otherwise the doors are left open to the extremes of popular fancy in regard to the actual conditions existing in such obscure cases.

It appears that peripheral sensory irritation may sometimes produce a fatal combination of shock and cardiac paralysis, of which the following cases may serve as illustration: Vibert<sup>2</sup> has reported the sudden death of a young woman, four months pregnant, while a small cannula was being inserted into the uterus to produce abortion. He refers also to other cases of sudden death after uterine douches. Bonvalot<sup>3</sup> reports several cases of sudden death during manipulation of the pregnant uterus, and considers the deaths to be referable to reflex inhibition of the heart's action and of respiration. Brouardel refers to several cases of sudden death occurring after simple vaginal examination. Great caution must be exercised, however, before concluding that death has not resulted from some definite and adequate mechanical condition or other lesion which is produced by or is coincident with such minor procedures. Hoffman demonstrated a considerable injury to the placenta and an extensive pulmonary embolus in a case of sudden death follow-

<sup>1</sup> Zeitschrift für Medicin, 1891, S. 137.

<sup>2</sup> Annales d'Hygienes publiques, 1890, xxiv, p. 541.

<sup>3</sup> Ibid., xxviii, p. 444.

ing the injection of hot water into the uterus. A very careful post-mortem examination is therefore required before such mechanical causes of death can be excluded and the fatalities be referred to shock or syncope.

To a somewhat similar condition of shock and syncope may be attributed the deaths occurring after the sudden withdrawal of large amounts of fluid from the abdominal and thoracic cavities. Catheterization of the distended bladder or paracentesis of the peritoneal, pleural, or pericardial cavities has not infrequently been followed by sudden heart failure and death. The rapid lowering of blood-pressure that follows the removal of large amounts of fluid in these cavities is chiefly responsible for death in such cases. To what extent fatalities attributed to shock and syncope are referable to the *constitutio lymphatica*, to be considered later, is an important matter for future investigation.

While in shock and syncope the arterial anemia results from cardiac weakness, in hemorrhage the arterial anemia, due to actual loss of blood, is the cause of cardiac weakness and syncope. The symptoms of the two conditions are, therefore, more or less similar, but the findings at autopsies are quite different, the central veins being overfilled after death from shock and syncope, while in death from hemorrhage the blood content of all the viscera and vessels is uniformly diminished.

**External hemorrhage** as a cause of sudden death is easily recognized, but the bleeding may take place into the cavities or hollow viscera of the body, when death occurs with symptoms of anemia and syncope, but without any apparent loss of blood. Well-known examples of this manner of sudden death are seen in the **rupture of extra-uterine fetal sacs**, in the **concealed intestinal hemorrhages** of typhoid fever, and in the **rupture of internal aneurysms**. The blood in pulmonary hemorrhage may be swallowed, and sudden death may result without hemoptysis. Fatal concealed hemorrhage into the stomach and intestines may result from ulcer of the stomach or from the congestion produced by a cirrhotic liver, while some diseases of the blood attended with severe anemia may prove suddenly fatal at any time from internal hemorrhage, usually into the stomach and intestines. Newborn infants are especially liable to perish suddenly from internal hemorrhage into the hollow viscera or cavities. Such hemorrhages in the newborn may be due to hemophilia and to venous congestion from asphyxia, and it appears, from the researches of Tizzoni and Giovannini, Babes, Neumann, and others, that they are often the result of infection with pathogenic bacteria.

The extent of hemorrhage required to induce death varies with the age and strength of the patient. It is generally stated that the loss of one-quarter of the total volume of blood will prove fatal. Children are much more susceptible to the effects of hemorrhage than are adults, and at any age a very rapid hemorrhage is much more dangerous than a gradual loss of the same quantity of blood.

**Diseases of the arteries** may tend to sudden death either by



the formation and rupture of aneurysms or by secondary disturbances in the circulation.

**Arteriosclerosis** affects every age after puberty, and the obscure character of the symptoms, even in the presence of advanced lesions, renders the disease a common cause of unexpected death. The marked frequency with which the lesion is found principally or exclusively in a single system of vessels, as the cerebral, pulmonary, or aortic systems, adds to the difficulty of determining the real condition of the patient as judged by the state of the superficial vessels and the urgency of the symptoms. Thrombosis, embolism, and the rupture of aneurysms are the usual terminations in such cases. But these accidents do not always prove immediately fatal. A period of some hours or days usually elapses before death in the fatal cases, except when the infarcted area or hemorrhage is very large and is situated in the medulla. Almost instantaneous death usually follows the rupture of large aortic aneurysms, the blood-pressure falling so rapidly that the quantity of escaped blood found at autopsy may be so small as to indicate that death had not resulted from hemorrhage alone.

**Rupture of the aorta** may occur and lead to sudden death in the absence of marked alteration in the vessel walls, but is usually found associated with the cardiac hypertrophy and arteriosclerosis of chronic nephritis.

**Traumatic rupture of internal arteries**, without extensive outward injury, may lead to sudden death, which might readily be referred to the shock of the injury. Inflammatory changes in the neighborhood of large arteries sometimes lead to sudden and fatal rupture of these arteries. Tidy refers to 2 cases of perforation of the aorta and of the vertebral artery resulting from angular curvature of the spine.

The toxic condition of the blood to which acute uremic seizures are probably to be referred is associated with **attacks of spasmodic contraction of the arteries**, which are undoubtedly an important factor in the fatal termination so frequently seen in this condition.

Some obscure cases of sudden death are attributable to **inflammation, thrombosis, and embolism of the veins**. Occlusion of the cerebral sinuses or of many of the cerebral veins may result fatally, but usually only after an interval of some days. There are on record a number of sudden deaths due to the loosening of a clot from some inflamed peripheral vein and its lodgment in the right heart and pulmonary artery. Very slight manipulation of the affected limb has been sufficient in these cases to detach the masses of coagulum which are loosely held in the inflamed vessel. After parturition clots from the uterine sinuses have been carried to the pulmonary arteries, producing extensive occlusion of these vessels and leading to very sudden death. It is probable that phlebitis and thrombosis are more frequent complications of gonorrhea in the female than is at present recognized, and that the unexpected fatal termination of some of the cases recently reported finds its true explanation in pulmonary embolism from this source.



The **entrance of air into the veins** has been recorded as the cause of death in rare cases in which an operation was being performed about the great vessels of the neck.

I have been unable to find authentic reports of such accidents in recent literature. Experiments on animals show that very large quantities of gas may be thrown into the circulation without producing death, and it is difficult to see how such quantities can gain access to the circulation under the conditions described in surgical operations. The evidence regarding fatal air embolism in man must therefore be accepted with caution.

The importance of **fat embolism** as a cause of sudden death after injury has gained increasing recognition since the first demonstration, by Zenker, of fluid fat in the pulmonary capillaries after rupture of the stomach and liver. The principal origin of the fatty emboli was believed to be foci of pus which had undergone fatty degeneration, until it was shown by Busch<sup>1</sup> that its usual point of origin is the bone-marrow. From the cases cited by Wintritz<sup>2</sup> it appears that injuries of soft parts containing fat may be a source of extensive fat embolism, while Virchow<sup>3</sup> found in the crushing of pelvic adipose tissue a possible cause of some fatal cases of eclampsia in which fat emboli were discovered in the lungs.

The fatal process in fat embolism may readily be followed, as described by Cohnheim.<sup>4</sup> Passing from the site of the injury into the open mouths of the veins (or lymphatics, Busch), the fluid fat is lodged in the capillaries of the lungs, and less abundantly in the kidneys, brain, heart, liver, etc.

Owing to the extensive occlusion of the pulmonary capillaries, the venous blood is unable to pass through the lungs, and the right heart and general venous system become engorged with blood, while the blood content of the right side of the heart is greatly reduced. Then follow venous transudation and capillary hemorrhage, which are apparent to the naked eye in the excessive pulmonary edema and in the punctate hemorrhages seen on the pleural surfaces and throughout the parenchyma of the lung. Occasionally ecchymoses of similar origin may be found in the viscera, in the brain, pia mater, mucous membranes, and conjunctiva. The occurrence of emboli in the general venous system is regarded as the sole cause of death from fat embolism by Scriba, who denies that pulmonary embolism of this character can ever be so extensive as to produce death. This belief is not generally accepted, and the cases reported by von Bergman, Czerny, and others<sup>5</sup> indicate that death is caused by pulmonary edema and venous stasis.

The presence of a moderate amount of fat in the capillaries of the lungs and other viscera is not, alone, a certain proof that this condition has been the cause of death. It has been shown by Scriba<sup>6</sup> that a

<sup>1</sup> Virchow's Archives, 1866, vol: xxxv.

<sup>2</sup> Vierteljahresschrift für gerichtliche Medicin, 1896, p. 47.

<sup>3</sup> Berliner klinische Wochenschrift, 1886, No. 30.

<sup>4</sup> Untersuchungen über die embolische Prozesse.

<sup>5</sup> See Wintritz, loc. cit. <sup>6</sup> Deutsche Zeitschrift für Chirurgie, 1880, Bd. xii.

moderate grade of general fat embolism may be found after death from pyemia, chronic osteomyelitis, or chronic suppuration, when the entrance of fat into the circulation is of secondary importance. Therefore it is only when the obstruction of the pulmonary capillaries is extensive that the presence of fat embolism can be regarded as an important factor in the fatal issue. Yet, according to Virchow and Wintritz, a moderate grade of fat embolism may induce death in subjects who have been weakened by disease or hemorrhage.

In order completely to establish the diagnosis of fat embolism as the cause of death it is required that the clinical history should furnish a probable cause, such as a severe injury, with, or possibly without, fracture of bones or crushing of soft parts; that the manner of death should indicate an obstruction of the pulmonary circulation; and that the microscopic examination of the lungs and other viscera should disclose an extensive engorgement of the capillaries with fluid fat.

The studies of Ribbert<sup>1</sup> indicate that fat embolism may be a more frequent and important occurrence than has previously been supposed. This investigator, after repeated blows upon the tibia in healthy rabbits, was able to demonstrate the presence of fat emboli in considerable extent throughout the lungs, brain, heart, and some other tissues, from which he infers that, even without fracture of bones, the fat of the marrow may be rendered mobile, enter the circulation, and produce fat embolism, with marked lesions in the lungs, brain, and heart. He calls attention to the fact that the quantity of fat found in the organs is apparently much greater than that usually found crushed by fractures, indicating that it must have been derived from other regions than the point of fracture. Ribbert, therefore, suggests that in cases of sudden death from violence, not adequately explained by the gross lesions, the possibility of fat embolism should always be considered. The possible importance of fat embolism in traumatic neuroses is naturally suggested by these experiments.

**Status lymphaticus** is a factor of great medicolegal importance in many cases of sudden death. This condition is characterized by a feminine type of bodily conformation in the male, delicacy of integument, absence of axillary hair and feminine type of pubic hair, abundant subcutaneous fat, often evidences of rickets, hypoplasia of heart, aorta, and other arteries, persistence of thymus, and hyperplasia of lymphatic tissues in spleen, ileum, and tonsillar ring. All of these features may be present about the time of puberty, but in later life the thymus and lymphoid tissues atrophy. In the adult male the signs may be limited to hypoplasia of heart and arteries, infantile genital organs and breasts, and scanty hair. Eunuchoidism is probably an exaggeration of the feminine characters in male subjects of status lymphaticus.

The condition was first recognized in cases of sudden death by Paltauf, Kolisko, and the Vienna school of pathologists. The writer described an American case in 1897 and has recently reviewed the pres-

<sup>1</sup> Correspondenzblatt für die Schweizer Aerzte, 1894, Bd. xxiv.

ent state of our knowledge. The general medical and medicolegal importance of the condition is now widely recognized.

**Occurrence.**—In the Bellevue Hospital material Symmers found among 5652 necropsies 457 cases of status lymphaticus. Of these, 249 were analyzed, showing that 118 were active, 89 recessive, and 42 partial. It was most frequent between twenty and forty years.

**Clinical Features.**—In infants many cases of unexpected death, occurring instantly or after rapidly increasing dyspnea or heart failure, have revealed only an enlarged thymus which appears to have mechan-



FIG. 133.—Peyer's patch from a case of status lymphaticus (photograph by Dr. E. Leaming).

ically obstructed breathing and heart action. This so-called "thymic death" is one of the most numerous and best known groups of cases. Death under anesthesia occurs in a large proportion of cases in subjects of status. Cardiac and arterial hypoplasia chiefly determine the fate of most adult subjects. Here may be classed the numerous cases of sudden death while bathing, or after slight trauma, as the careless injection of alien proteins, typhoid vaccination, or salvarsan. It is quite probable that the small heart and delicate aorta are particularly subject to functional disorders, inflammatory lesions, aneurysms, and rupture. Apoplexy in young adults is a highly characteristic termination of status which is comparatively frequent in medicolegal practice.



The lesion usually occurs in the vessels of the base, which are free from sclerosis, while nephritis is usually absent.

A high proportion of rapidly fatal cases of infectious diseases are found to occur in subjects of status. Most cases of fatal toxic Graves' disease show enlargement of the thymus and other signs of status. Subjects of status are relatively resistant to tuberculosis which takes the form of caseous lymphatic lesions, solitary brain tubercle, atypical bone lesions, and Addison's disease. Generalized Hodgkin's disease usually occurs in cases of status.

Disorders of the endocrine glands are concerned in various ways. The bodily conformation has some of the features of adiposogenital dystrophy, and many cases of hypophyseal dystrophy of Froelich's type are associated with other and pronounced signs of status. Hypoplasia of the genitals is common. Hypoplasia of the adrenals may be quite marked.

The brain in early life may be oversized, and later many forms of nervous and mental disease appear to be connected with status. Many of the subjects are mentally deficient, but others show a high grade of intellectual development. Ohlmacher found that the great majority of fatal cases of epilepsy are subjects of status. Bartels observed in a series of 122 cases of suicide that signs of status were practically constant and often pronounced. Symmers found hypoplasia of the heart and aorta in all of 5 cases of caisson disease.

**Pathogenesis.**—Status lymphaticus is obviously a congenital condition, but does not appear to exhibit hereditary characters. The high development of the bony and muscular systems in many cases may perhaps be connected with the hyperplastic thymus. Cameron attributes the lymphatic hyperplasia of infants to chronic inflammation of various mucous membranes, and designates this condition as "status catarrhalis." Although the exact manner of death is often obscure, yet the anatomic peculiarities observed in the body seem directly connected with the diminished resistance to trauma and infection which these subjects show.

From this brief review it is obvious that the presence or absence of status lymphaticus should be carefully determined in all medicolegal autopsies.<sup>1</sup>

**Disturbances of the respiration** resulting, for the most part, from partial or complete occlusion of the respiratory passages or from diseases of the lungs, are important causes of sudden death.

Sudden and complete occlusion of the respiratory passages is usually the result of violence, but children frequently, and adults occasionally, die from rapid stenosis of the larynx or bronchi in the course of disease. **Acute laryngitis** in the adult may be complicated by sudden edema of

<sup>1</sup> Paltauf, Wiener klinische Wochenschrift, 1890, p. 172. Ewing, New York Medical Journal, 1897, vol. 66, p. 37. Journal American Medical Association, 1918, vol. 71, p. 1525. Symmers, American Journal Medical Sciences, 1918, vol. 156, p. 40. Ohlmacher, New York Medical Journal, 1898, vol. 68, p. 443. Cameron, Proc. Royal Society, 1917, vol. 10, No. 8, Diseases of Children, p. 133. Bartels, Wien. Klin. Woch., 1908, 1826.



the larynx and glottis, causing death at a time when the general condition gives no urgent indication of such danger. In the infant **laryngismus stridulus**, with or without an accompanying laryngitis, may prove suddenly fatal. In the absence of laryngitis the autopsy would reveal only the evidences of asphyxia or, perhaps, the signs of the *status lymphaticus*.

Newborn infants are especially exposed to the danger of asphyxia from the inhalation of mucus and meconium during labor, and of stomach contents shortly after birth.

An **enlarged** and **persistent thymus** is claimed by many to be directly responsible for some unexpected deaths in infants and children.

The possibility that an enlarged thymus might, by pressure, cause sudden asphyxia was first suggested and denied by Friedleben, in 1858. Important evidence against the possibility of death by such compression of the trachea has been furnished by Scheele, who showed that a weight of 1000 gm. (2.2 pounds) is usually required to close the infant's trachea, and pointed out that no instance had yet been seen in which the trachea appeared softened or flattened by pressure of the thymus. Nevertheless, cases of sudden death with symptoms of tracheal stenosis coincident with enlargement of the thymus have been so numerous that it has been necessary to admit the connection of the thymus in these cases, and to refer the usual manner of death to causes other than stenosis by pressure. One of the important recent studies of the subject is contributed by Pott.<sup>1</sup> From an examination of 10 cases Pott concludes that the enlarged thymus exerts a mechanical influence on the heart, which may cause death. It is shown that the hyperplastic gland usually lies upon the pulmonary artery and aorta, and covers the right auricle and two-thirds of the right ventricle. The heart is, therefore, subjected to direct pressure not only from the weight of the gland, which may reach 50 gm. (1½ ounces), but also from any acute swelling which may affect it. In 2 of the 10 cases there was adherence of the thymus to the pericardium, which the author believes to be of considerable importance. Not only may the heart and vessels be compressed, but, in Pott's opinion, the enlarged organ may narrow the upper opening of the thorax, compress the trachea, and, by pressure upon the vagi and recurrent nerves, may cause spasm of the glottis, which the clinical history indicates to be the manner of death in many cases.

In a later critical study of the subject Seydel<sup>2</sup> recognizes hypertrophy of the thymus as a cause of sudden death in infants, and gives as a possible explanation spasmodic laryngismus, a rudimentary form of eclampsia, exaltation of a cerebral "spasm center," and cardiac paralysis. A rather different opinion is held by Paltauf<sup>3</sup> and others. In 225 cases of asphyxia in infants Paltauf did not find that the thymus, although often very large, ever compressed or narrowed the trachea. Bronchitis was, however, a frequent cause of death in these

<sup>1</sup> Jahrbücher für Kinderheilkunde, 1892, S. 118.

<sup>2</sup> Vierteljahresschrift für gerichtliche Medicin, 1893, S. 55.

<sup>3</sup> Wiener klinische Wochenschrift, 1890, No. 9.

cases, and when this cause was wanting, Paltauf referred the deaths to the presence of the *lymphatic constitution* already described, which, by disturbance of the blood-pressure, circulation, and nervous system, may, under proper exciting conditions, lead to cardiac paralysis.

It may, therefore, be concluded that the hyperplasia of the thymus, or some undetermined condition usually associated with it, may stand as a cause of sudden death, as appears amply demonstrated by clinical reports. There is no doubt in the writer's opinion, based on his own observations, that fatal occlusion of the larynx or trachea occurs from the pressure of the enlarged thymus of status lymphaticus, and from an enlarged thyroid, especially the congenital parenchymatous goiter.

An **enlarged thyroid** compressing the larynx and trachea has occasionally been reported as the cause of sudden death. As with enlargement of the thymus, opinions are at variance as to the manner of death from this cause. Death has been referred to a spasmodic closure of the glottis caused by the irritation of an enlarged or inflamed thyroid. Others claim to have found softening and atrophy of the laryngeal and tracheal cartilages, and believe that asphyxia may result from direct compression of the trachea (Rose, Eppinger, Wolfler). Müller and Ewald have not found such changes in the cartilages and do not regard such a lesion as the common condition in cases of enlarged thyroid resulting in sudden death, apparently excluding from this category the well-recognized examples of tracheal stenosis due to tumors of the thyroid. Krönlein believes that the contraction of the cervical muscles may give a fatal addition to the pressure ordinarily exerted upon the trachea by an enlarged thyroid.

It appears from the study of Ewald<sup>1</sup> that when sudden death results from enlargement of the thyroid, this gland will usually be found closely bound to the trachea by new connective tissue. This condition, which has long been known as of rather frequent occurrence, is referred by Paltauf<sup>2</sup> to an inflammatory process, and by Ewald and others to an inward growth of aberrant masses of glandular tissue which have been found even projecting within the larynx and trachea. In such cases the veins of the thyroid have been found dilated and tortuous, owing to constriction by the new tissue, and the larynx and trachea have been found asymmetrically compressed. When such a condition has been established, any cause leading to marked acute hyperemia or venous congestion of the thyroid may readily produce complete stenosis of the larynx or trachea and sudden death. Among such causes may be mentioned pregnancy, muscular exertion, mental emotion, and acute inflammation of the larynx, trachea, or enlarged thyroid.

**Diseases of the lungs**, which ordinarily are attended with pronounced symptoms, have been found the basis of sudden and unexpected death. The prostration which usually marks the onset of *lobar pneumonia* may be successfully supported or even little noticed, especially by homeless tramps in large cities, until the sufferer drops dead

<sup>1</sup> Vierteljahresschrift für gerichtliche Medicin, Sup., 1894, S. 33.

<sup>2</sup> Ziegler's Beiträge, 1892, S. 71.

in the street. In Westcott's series of cases this fact was so apparent as to call for special remark on the frequency of this lesion in bodies "found dead" and coming under the charge of city authorities. The danger of sudden heart failure at all stages of this disease, and even during convalescence, is a matter of rather common demonstration in hospitals where patients are carefully watched throughout the course of the malady. Syncope alone may account for such deaths, or thrombosis of the heart and pulmonary vessels may be found at autopsy. Rarely the disease is fatal within a few hours of its onset, from the large extent of the lesion, from congestion and edema of the lungs, or from other unusual complications.

*Pulmonary tuberculosis* terminates suddenly, when the patient has retained a moderate degree of strength, from a variety of complications. Most frequently the rupture of a large eroded blood-vessel causes sudden fatal hemoptysis, or the escaping blood from a smaller vessel may be swallowed and the hemorrhage be concealed. The formation of pyopneumothorax may be very rapidly fatal, or edema of the active lung or acute heart failure may terminate the disease at a time when the dangerous condition was not fully recognized. Tuberculous myocarditis associated with a moderate or extensive pulmonary lesion may be a suddenly fatal complication.

*Acute pulmonary edema* arising in the course of chronic nephritis or arteriosclerosis is usually of sudden onset and may be rapidly fatal. The condition of the pulmonary parenchyma and the filling of the bronchi with frothy, blood-stained serum are characteristic postmortem indications of death from this cause. Fatal hemoptysis may result from other causes than tuberculosis of the lungs, the rupture of aortic aneurysms being the most frequent origin of profuse hemorrhage from the lungs not referable to phthisis. The writer has the records of a case in which the patient, otherwise in fair health, died almost instantly from a profuse hemoptysis of which no other explanation appeared than that of hemophilia. At the autopsy the bronchi from which the hemorrhage originated were filled with blood down to their minutest branches, and their walls congested. Aside from a little aspirated blood in the air-vesicles, the pulmonary parenchyma appeared normal. This patient had had a similar very severe hemoptysis ten years before, but her family history failed to show that any relatives suffered from the hemorrhagic diathesis.

**Acute bronchitis** involving the finer bronchioles and often complicated by bronchopneumonia sometimes leads to very rapid suffocation. Many sudden deaths in infants and the aged are referable to this cause, and Brouardel refers to similar conditions occurring in adults.

Of **diseases of the pleura**, large serous effusions have at times proved suddenly fatal through pressure on the heart and large blood-vessels or by direct interference with respiration. These effusions may be very rapidly formed, but more frequently the sudden fatality results from a gradually accumulated exudate, which has existed for some weeks with increasing dyspnea.



The **lodgment of a mass of food**, generally a large piece of meat, **in the larynx** is a relatively common cause of instantaneous death. This peculiar accident has been particularly frequent in large cities. The usual history is that the victim entered a restaurant and was eating rapidly of a lunch of stewed meat, when he suddenly dropped to the floor and was dead when picked up. At autopsy the bolus of meat is found wedged in the larynx. The death is generally asserted to have been instantaneous, which suggests some form of reflex inhibition of respiration and cardiac action. At a meeting of the New York Pathological Society Schultze exhibited 6 cases of this type collected within a relatively short time.

**Chronic diffuse nephritis** is, among organic diseases, one of those most frequently leading to unexpected death. When the lesion takes the form of the "contracted kidney," a sudden termination without previous marked symptoms is so frequent that medical writers commonly describe certain groups of cases in which sudden death without premonitory symptoms is the usual course of the disease. As a rule, sudden death occurs in these cases during an attack of acute uremia with general contraction of the arteries. When nephritis is followed by or associated with arteriosclerosis, the conditions are especially favorable for a sudden termination by rupture of diseased blood-vessels. Even without important lesion in the vessel walls the increased arterial tension and overaction of the heart, in chronic nephritis, may lead to rupture of the thin cerebral arteries, or even of the aorta.

It has already been noted that cerebral hemorrhage is immediately fatal only in a minority of the cases, as when the lesion is of very wide extent or affects a vital center.

Chronic diffuse nephritis may also terminate suddenly with severe **bronchial dyspnea** and pulmonary edema, or with **intestinal symptoms** resembling cholera.

The **liver** is not often the seat of lesions leading to unexpected death. The rupture of abscesses or cysts may be rapidly fatal from shock, hemorrhage, and peritonitis, but such lesions have usually prostrated the patient before the onset of the fatal complication. Biliary colic in rare instances has proved rapidly fatal, even without complications.

The **stomach** may be the seat of sudden fatal hemorrhage, due to ulcer, cancer, or chronic congestion from cirrhosis of the liver. The rupture of a gastric ulcer into the peritoneum is not infrequently fatal within a few hours. **Ulcer of the duodenum**, as a rule, gives fewer premonitory symptoms than ulcer of the stomach, and in a larger percentage of cases leads to unexpected death from perforation or hemorrhage. Brouardel describes, under the term "**dyspeptic coma**," some sudden fatalities in which the autopsy revealed chronic constipation or partial intestinal obstruction, but admits that these cases are of very infrequent occurrence.

**Acute hemorrhagic pancreatitis**, on account of the obscurity of the symptoms and the usual rapidity of its course, has attracted con-



siderable medicolegal interest as a cause of sudden death. A very complete presentation of this subject is contributed by Fitz<sup>1</sup> in the Middleton-Goldsmith Lecture for 1889. As shown by Fitz, the frequency and importance of pancreatic hemorrhage as a cause of sudden death is of recent recognition, the earliest reported cases being those of Spiess (1867) and Klebs (1870). In 1874 Zenker<sup>2</sup> reported 2 cases of sudden death from pancreatic hemorrhage, and having found marked venous congestion of the solar plexus and abdominal organs, he attributed the deaths to shock and cardiac paralysis. Since that time other cases have been accumulated by Kollman, Draper, Fitz, and others, so that the tables of Fitz comprise 16 well-authenticated instances of sudden death referable to no other lesion than pancreatic hemorrhage. It appears from these cases that fatal hemorrhage may occur in a previously diseased pancreas or when the individual is apparently in sound health, and the pancreas otherwise entirely free from evidence of disease. Predisposing and exciting causes cannot be definitely stated, although the majority of cases occurred in comparatively fat individuals, and traumatism and intemperance were noted in others. The onset of the hemorrhage was invariably attended by immediate prostration or collapse, and death ensued in from one-half to thirty-six hours. At the postmortem the pancreas is found infiltrated with fresh blood, either wholly or in part, and diffusely throughout the connective tissue or in circumscribed areas. The infiltration with blood may involve the subperitoneal tissue about the pancreas, or extend into the omentum, mesentery, behind the colon, or into the perinephritic fat, while the pancreatic tissue is either normal or in a condition of fatty infiltration or degeneration. The exact origin of the hemorrhage has not been demonstrated, but from its rapidity and extent Fitz believes it to be arterial rather than venous, and denies that it results from ruptured aneurysms or fat necrosis. Seitz,<sup>3</sup> however, reports a case of suddenly fatal pancreatic hemorrhage resulting from syphilitic changes in the vessels of this organ.

Previous to publication of the abundant proof reviewed in the article of Fitz it was not universally recognized that pancreatic hemorrhage must be admitted as a cause of sudden death. Dietrich<sup>4</sup> concludes the report of a fatal case of hemorrhagic pancreatitis with the opinion that the importance of pancreatic hemorrhage as a cause of sudden death is still hypothetical and of little consequence to the medical jurist. This statement well represents the old skepticism on the subject, and the writer was probably not familiar with the evidence collected by Fitz. Of greater value is the report of Reibold<sup>5</sup> of pancreatic hemorrhage in 3 cases of death from other causes, one, a fat woman, thirty-four years old, dying from morphinism; another, a man of fifty years, who suicided by hanging; and a third, a man of thirty-five years,

<sup>1</sup> See Proceedings of the New York Pathological Society, 1889.

<sup>2</sup> Deutsche Archiv für klinische Medizin, Bd. ii, S. 351.

<sup>3</sup> Zeitschrift für klinische Medizin, 1892, S. 1.

<sup>4</sup> Vierteljahresschrift für gerichtliche Medizin, Bd. lii, S. 43.

<sup>5</sup> Virchow's Jahresbericht, 1887, Bd. i, S. 503.

dying from hemorrhage in another locality. Reibold concludes that pancreatic hemorrhage is merely a sign of disturbed circulation, a conclusion that was doubtless correct in his 3 cases. The conclusions of Fitz have been amply supported by several later studies, and it may safely be held that pancreatic hemorrhage may stand alone as a cause of sudden death. The exact origin of the hemorrhage and the consequence of events which leads to the fatal issue in these cases are still largely undetermined. Of 17 cases of acute hemorrhagic pancreatitis collected by the same author, it appears that when hemorrhage results from acute inflammation of the pancreas death is not usually so sudden as to excite surprise, for in these cases pronounced symptoms marked the course of the disease for at least three days. A more rapidly fatal case of this disease has since been reported in at least 2 instances (Sticker, Kraft<sup>1</sup>), in which very sudden death resulted from acute hemorrhagic pancreatitis.

The **spleen**, when greatly swollen, may rupture spontaneously or from slight traumatism, and sudden death may follow from shock and hemorrhage, but such accidents usually occur in the course of severe infectious disease and, except in pernicious malaria, do not become of medicolegal interest. Zenker<sup>2</sup> records a case of sudden death from spontaneous hemorrhage at the hilus of the spleen.

Aside from profuse hemorrhage arising from various causes, *lesions of the intestines* rarely prove immediately fatal. Extensive strangulation of the intestine by volvulus, bands, or hernia may, however, cause death within a few hours.

**Diseases of the nervous system** are rather less frequent causes of sudden death than are affections of either the respiratory or the circulatory system.

**Apoplexy**, in its most usual forms, has been considered in connection with the blood-vessels. **Chronic hemorrhagic pachymeningitis** may terminate in an extensive hemorrhage which proves suddenly fatal after one of the periods of temporary improvement, and in a case recently referred to by the writer this malady caused a sudden and unexpected death, with symptoms of headache, coma, and collapse, but without hemorrhage. **Acute purulent meningitis** is occasionally fatal in children or adults during the first few hours of the violent onset that usually characterizes epidemics of this disease, and in some cases even without any previous marked symptoms. Elser and Huntoon<sup>3</sup> have shown that nearly all of these fulminant cases occur in subjects of status lymphaticus.

Of the various diseases terminating in sudden convulsions and coma, some are directly referable to the brain and nervous system. **Epileptic convulsions** are usually survived, but death results after repeated seizures from cardiac failure, from accidental traumatism, or, occasionally, from attacks of *grand mal*.

<sup>1</sup> Virchow's Jahresbericht, 1894, Bd. ii, S. 225.

<sup>2</sup> Deutsche Archiv für praktische Medizin, 1874, Bd. ii, S. 351.

<sup>3</sup> Jour. Med. Research, 1909, 20, 377.

Acute **uremic** or diabetic coma is often followed by death, and while the former commonly occurs without marked premonition, the latter is rare except in advanced stages of the disease.

**Acute alcoholism** proving fatal shortly after the ingestion of a large amount of liquor or terminating suddenly after prolonged excessive indulgence is responsible for a considerable number of sudden deaths coming under the notice of municipal authorities. Of Westcott's 303 entirely unexpected deaths, 29 per cent. were due to the abuse of alcohol. The usual history of these cases is that the subjects were found dead after a night's debauch, or that they died soon after a few violent convulsions—"rum epilepsy"—which terminated a more prolonged spree. The postmortem usually discloses one or all of three gross conditions—the presence of alcohol in the stomach, acute congestion of the gastro-intestinal tract, and changes in the viscera resulting from chronic alcoholism. These cases are invariably characterized by deep coma, and death is to be attributed to an acute toxemia principally affecting the nervous system. **Chronic alcoholism** may end in sudden death through the changes it produces in the viscera, especially in the heart and blood-vessels, and it is a very general predisposing cause of many other forms of sudden death.

The **acute infectious diseases**, in their malignant forms, may prove very rapidly fatal. **Lobar pneumonia** and **cerebrospinal meningitis** furnish frequent examples of this sort. In epidemics of **Asiatic cholera** the stage of collapse and death may appear in a few hours from the onset, and rarely **cholera morbus** is fatal when it attacks aged or enfeebled individuals or infants. Sudden deaths from **yellow fever** and **pernicious malaria** are not seen in northern latitudes, but are not unknown in tropical regions.

Certain **general etiologic factors** are recognized as affecting the frequency of sudden deaths from natural causes. Persons of advanced age are more liable to sudden death than the young. In children the usual order is reversed, and sudden deaths are more frequently due to asphyxia than to heart failure. Cold weather favors the occurrence of sudden deaths, but certainly much less than does the excessively hot weather of the American summer. During the severe hot weather of August 8 to 15, 1896, there were in New York City 651 deaths from sunstroke, and the number of sudden deaths from unknown causes was enormously increased. Sudden changes of temperature and of barometric pressure also increase the number of sudden deaths.

## PRESUMPTION OF DEATH

It is contrary to the tendency of modern law that the courts should recognize any *presumption* in matters of fact which, if the facts were known, could be determined with certainty. This principle is more strictly followed at the present day in questions of survivorship, in which it is generally held in England and America that in the absence of proof as to which of two persons died first when both perish in the



same catastrophe the law can recognize no general presumption as to which of the two may be regarded as the survivor. The legal death of persons long absent and unheard of, but not proved to be dead, is, however, presumed by courts of law after the period of seven years.

In such cases there may be no evidence of death other than the prolonged and inexplicable absence of the individual. At other times the evidence may be very strong that the person in question has perished, as when the ship on which he is known to have sailed has never been heard of or has been shown to have been wrecked. Here, in the absence of full legal evidence of death and of all traces of a dead body, the law may presume the fact of death long before the usual period of seven years has elapsed. In the presence of such evidence, also, insurance companies usually settle claims at the expiration of one or two years. The direct proof of death in these cases is, therefore, not required, but the law assumes that the logical presumption of death is sufficient.

Further, it becomes necessary fully to establish the fact of the life of such persons supposed to be dead in order to secure a conviction for alleged bigamy or other crimes. It has been ruled by English courts that a wife may legally marry again after some years of absence of her husband, even though she has not made proper attempts to learn whether or not her husband is still alive, the presumption of the law in favor of the death of persons long absent being very strong. American courts are inclined, however, to require that reasonable search for the absent party must be made, what constitutes "reasonable search" being a mixed question of fact and law.<sup>1</sup>

The ordinary presumption of death may be *strengthened by other presumptive evidence*, such as threats of suicide.<sup>2</sup> Or, the presumption of death may be set aside by *conflicting presumptions*, and even by hearsay and other classes of evidence not ordinarily admitted by the courts, the tendency justly being to recognize every trace of fact rather than rest upon presumption. There could be no reasonable presumption of death, for example, if the person had absented himself for years after the commission of some crime.

When a decision rests upon the life or death of a person at some particular period of seven years, the presumption of the law does not cover the point, and further evidence as to the time of death is required. In such cases medical evidence may prove of decisive import, indicating the state of the individual's health when last seen. Here, also, a consideration of many of the questions mentioned as affecting the presumption of survivorship may be involved. An applicable illustration referred to by Tidy<sup>3</sup> is the case of the Beasley trusts: "A person who was entitled to the dividends on stock payable in April and October applied for his dividends in April. He was last seen in August of the same year, when he was in a very bad state of

<sup>1</sup> Clark *vs.* Owens, 18, New York, 434.

<sup>2</sup> Sheldon *vs.* Ferris, 45 Barb., 124, New York.

<sup>3</sup> Loc. cit.



health. He never applied for his half-yearly dividends in the ensuing October. It appeared that he was of dissolute habits, and depended chiefly on the dividends for his maintenance. The question in the case was whether he died before November of that year. It was held that not having applied for the October dividend, and in consideration of the state of his health when last seen, the presumption must be that he died before November."

By section 1582 of the New York Code it was ruled that when property was bequeathed to unknown heirs, these heirs were presumed to be dead after the lapse of twenty-five years. In the case of *People ex rel. vs. Ryder*<sup>1</sup> this legislation was declared unconstitutional, and there is at present no presumption of death in such cases.

### PRESUMPTION OF SURVIVORSHIP

At all times it has been found a difficult and important matter to decide which of two or more persons must be regarded as the survivor when all perish in a common accident, such decisions not infrequently transferring large portions from one heir to another.

It is at once evident that the decision should be determined strictly by the facts of the case, for it can hardly be supposed that the deaths of two or more persons in the same catastrophe are exactly simultaneous, while the difference in the time of death, however slight it may be, constitutes a real distinction. Yet the great variety of circumstances surrounding fatal accidents on sea and land and the usual lack of direct evidence as to the fate of the victims are usually insurmountable obstacles in the way of ascertaining these facts. Accordingly, the attitude of the law among civilized nations in treating the question of survivorship has been determined partly by ideas of expediency and partly by consideration of the probable course of events.

The old Roman law recognized general expediency, and to some extent the existing physical conditions, by holding that in the absence of proof as to which of two persons died first, a child above the age of puberty must be considered to survive a parent, while parents were held to survive children under puberty, and the husband was presumed to survive the wife.

The French law as embodied in the *Code Napoleon* is based entirely upon a consideration of the physical conditions, but recognizing the impossibility of determining the actual sequence of deaths, in the absence of proof, adopted as a fixed rule the probable sequence as shown by the age, sex, and strength of the victims. If those who perished together were under fifteen years of age, the oldest is presumed the survivor. If they were all above sixty years of age, the youngest is presumed the survivor. If some were under fifteen and others above sixty, the former are presumed the survivors. If the ages of all were between fifteen and sixty years, the males are presumed the survivors if the ages are equal or the difference does not exceed one year, and if they

<sup>1</sup> 65 Hun., 175.

are all of the same sex, the younger are presumed to survive the older persons.

A chief objection to the Napoleonic code is the extreme presumption in favor of infants, who may be held to survive men of sixty-one years of age, which, in fact, they must very seldom be able to do when exposed to the same physical conditions. Nor can either expediency or the probable facts be urged in favor of the presumption that a youth of fifteen must be considered the survivor of a man of forty. To a considerable extent, however, the presumptions of the French code represent the probable sequence of deaths if a number of persons of all ages and sexes were precipitated simultaneously into the water.

The Prussian law is similar in spirit with the Napoleonic code. The Mahomedan law of India ignores the whole difficulty by ruling that when relatives perish together in the same accident they must all be presumed to die at the same moment. In England and in most States of America courts have held that survivorship must be determined solely upon the evidence, in the absence of which there can be no presumption of the law in favor of any age or sex. In Louisiana, which was long under French rule, the Napoleonic code has been incorporated in the State laws.

Not only is there no presumption in favor of age or sex, but the courts have ignored some very strong presumptive evidence based upon the physical condition of the victims.

In the well-known case of *Wife vs. Angrave*,<sup>1</sup> husband and wife and children were swept by one wave from the deck of a vessel and disappeared. It was shown that the husband was a powerful swimmer, while the wife was a delicate woman and could not swim. Yet the House of Lords would not presume that one survived the other. The greater and decisive value placed upon very slight objective evidence is seen in the case of *Pell vs. Ball*.<sup>2</sup> Ball, his wife, and daughter were lost in an explosion on board the steamer *Pulaski*. The wife was seen after the explosion rushing about the deck and calling for her husband, who failed to reply. She was soon lost with the sinking vessel. The fact that the wife was seen alive after the explosion while the husband failed to appear or answer his wife's calls was sufficient evidence to establish the survivorship of the wife. Distinctly contrary to the spirit of these decisions is the ruling in Chancery in the more recent case of *Seelich vs. Booth*,<sup>3</sup> in which, of two brothers, one, the elder and master of a ship, the other, younger, and mate of the ship, both perishing in a wreck, it was held that the younger died first.

It appears that the province of medical testimony in establishing a presumption of survivorship is, in the opinion of the courts, rather limited. While it is probable that careful study of the circumstances connected with the fatality and of the physical condition of the victims will in many instances correctly determine the survivor, the law hesi-

<sup>1</sup> 8, H. of L. cases, 213.

<sup>2</sup> 1, Cheves Ch. cases, and American Journal Medical Sciences, July, 1845.

<sup>3</sup> Greenleaf on Evidence, p. 47.

tates to apply so general a rule of probability to individual cases. Yet the medical testimony in such cases is usually considered with care, and its proper presentation involves the consideration of many conditions affecting the tenacity of life in different individuals.

The **age** of the persons may have important bearing on the question of survivorship provided they have been exposed to identical conditions. As already shown, age was the principal factor considered in the construction of the Code Napoleon, in which it is held that there is no appreciable difference in the tenacity of life to be expected in persons between the ages of fifteen and sixty years. It is perhaps possible to make rather closer distinctions, however, in the physical vigor of individuals as affected by age.

Complete physical development is usually attained between the ages of twenty-five and thirty, and continued until fifty, although failing in many instances long before that time. There will, therefore, be no evidence based upon age capable of affecting the presumption of survivorship of persons between these ages, nor can it be claimed that in the absence of other influences there is always a considerable difference in vigor to be found between the extremes of puberty and adult life. But there is a very distinct probability that a middle-aged adult will survive a child or an aged person when both are exposed to the same violence, and there are numerous decisions that when a parent and infant child perish together, the presumption of survivorship is in favor of the parent. It is to be considered that some forms of violence are more fatal at some ages than at others. Children are very susceptible to the fatal effects of shock, hemorrhage, starvation, and of some drugs, but rarely perish from sunstroke.

The ordinary presumption based upon age may be outweighed by other presumptive evidence. If a father, mother, and child were found murdered, the usual presumption of survivorship would be exactly reversed in order, owing to the probability that the murderer would first attack the stronger person. If serious wounds were found upon the body of the older and stronger of two persons drowned at sea, or if the older were unable to swim while the younger was known to be a powerful swimmer, the presumption of survivorship might be reversed.

**Sex** is of somewhat less importance as a factor in survivorship. Other conditions being similar, there is an undoubted balance in favor of the survival of the male, when the loss of life results from the exhaustion of physical strength, and safety depends upon exertion or agility. It is probable, but not invariable, that men suffer less readily from shock and hemorrhage, and it has been claimed that women are superior in passive endurance.

The **state of health** may outweigh the presumptive evidence given by both age and sex. An adult male invalid may reasonably be expected to perish from any of the usual forms of violence before a healthy adult female or child, and there is abundant precedent to show that such evidence, reaching as it does almost to the grade of certainty, may be expected strongly to influence the decision of the court. It



may, therefore, become important to study in such detail as the evidence will permit the general condition of health of the persons concerned.

The **manner of death** and the circumstances surrounding it require consideration in every attempt to establish doubtful survivorship, and the evidence thus obtained will generally be found of more decisive nature than the consideration of age, sex, or state of health.

**Asphyxia.**—It is by many regarded as an established fact that women resist death from asphyxia longer than men, as is possibly to be expected from the known physiologic rule that women consume less oxygen than men. Partly on this account, in cases of asphyxia by gases, the chances of survivorship are usually granted to favor the woman. The observations on which this opinion are chiefly based are referred to by Guy and Ferrier.<sup>1</sup> "In 19 of 360 cases of poisoning by charcoal fumes which occurred in Paris in 1834–35, a man and a woman were exposed to these gases together. Of these, only 3 were saved, and these were women. In the solitary cases, 18 of 73 females and 19 of 83 males were restored, so that the chances in favor of the female are nearly as 15 to 14. In a case reported by W. Sardaillon, a man, his wife, and their child were asphyxiated in a porter's lodge. The child died, the father was very ill and with difficulty restored to life, while his wife was able to call for help and assist both husband and child." The foregoing evidence is interesting and valuable, but far from conclusive, for a single series of observations must be regarded as entirely inadequate to prove any general rule relating to facts in medicine. Observations in such cases, to be reliable, must include the minutest details of age, habits, state of health, and especially of the position of the bodies with reference to possible sources of air.

The proximity to air, as well as the relative exposure to injury, determines with considerable certainty the survivors in fatal accidents where bodies are piled one upon another, as occurs in panic-stricken crowds or in collapsed buildings. In disasters in mines, some bodies are commonly found injured by the explosion of firedamp, others suffocated by falling earth, still others slowly suffocated or exhausted, but lying in a portion of the mine less affected by the explosion, in which case the order of survivorship is clearly indicated.

In death by **drowning**, although men are more likely to be on the deck of a vessel at the time of an accident, are more active in avoiding danger, are more often good swimmers, are less encumbered by clothing, and are more self-possessed in securing life-preservers or other floating objects, the courts have repeatedly refused to place any great value upon such general presumptive evidence. If the bodies are recovered, it has been pointed out that marks of severe injuries will weigh against survivorship, and evidence of an attempt to save others, as shown by the position of two bodies, will tell in favor of survivorship.

**Cold.**—Men endure cold better than women, and adults better than the aged, while young children are least capable of withstanding its effects. In general, the greater the body weight, the longer will the

<sup>1</sup> Principles of Forensic Medicine, p. 312.



body require to cool and life be retained. The amount of clothing, the development of adipose tissue, and the state of health considerably affect the power of resistance against cold. The use of alcohol or narcotic drugs markedly increases the danger of death from cold, as both reduce temperature, muscular activity, and general sensibility.

**Heat** is not often concerned in questions of survivorship, and little is known of the relative tolerance of the ages and sexes. Children do not often perish from sunstroke. In death from **burns**, the physical examination and the position of the bodies will determine as far as possible the survivor. Children, being very susceptible to shock, early succumb to the effects of burns.

**Starvation.**—Children are rapidly exhausted by lack of food, and it is a common observation that the withdrawal of food for a few hours may determine the death of infants from acute gastro-intestinal diseases. It has been claimed that the aged are more tolerant to lack of food than are adults, a claim that can hardly be supported unless the aged person is in a better state of general nutrition. It would seem more reasonable and more in accordance with the evidence furnished by clinical experience that between adults and old persons the probability of survivorship depends less upon the quantity of food required at different ages than upon the state of nutrition and the development of adipose tissue. From the experience of professional fasters it is evident that life may be supported for long periods without food, by the use of water, and that the withdrawal of both food and water will prove more rapidly fatal than the lack of food alone.

**Electricity.**—The depth and extent of burns upon the body, the presence of metallic conductors of any sort in the clothing, and the position of the bodies with reference to the source of electricity may furnish indications, very obscure at best, of the probable survivor in death from this cause. The fatal effects of **lightning** have been distributed in the most irregular and inexplicable manner. The instantaneous character of the shock and our lack of detailed knowledge of the fatal action of electricity render the determination of survivorship in deaths from this cause especially difficult.

**Parturition.**—It is probable that in most cases of parturition ending fatally to mother and child, either with or without attendance, the child perishes before the mother, but the conditions in the case may distinctly indicate that the child survived the mother. The fact that the life of the child may continue *in utero* is amply attested by numerous successful postmortem deliveries. But only children born alive are legally recognized as living beings, so that the survival *in utero* need not be considered. In the absence of definite evidence that the child was stillborn it would appear that the usual facts are most accurately met by the decision of the Imperial Chamber at Wetzlar, quoted by Tidy, in favor of the child, on the ground that the mother sank exhausted by the pains of labor, while the child died subsequently from lack of nourishment. Such evidence of stillbirth may be the maceration of the skin, indications of prolonged second stage, signs of great com-

pression or molding of the head, a very extensive *caput succedaneum*, meningeal hemorrhage, and internal signs of death by acute asphyxia, with complete atelectasis of the lungs. When the mother dies of active hemorrhage after delivery, the chances are probably even more favorable for the survival of the child, which is capable of existence for some time after detachment of the placenta from the uterus. Yet all these considerations are usually outweighed by the ruling that the life of the child requires proof, while that of the mother does not, and decisions in such cases are usually in favor of the survival of the mother.

In death from **poisoning**, the quantity of the drug ingested, the age and physical condition of the victims, and the influences of idiosyncrasy should be considered.

The degree of postmortem changes may occasionally be worth considering when bodies are seen shortly after death, but only with the cautions emphasized in the section on Signs of Death.

In general, the minutest details in regard to the manner of death, the position of the bodies, and the results of postmortem examination should be considered with the usual expectation of reducing, in some slight degree only, the presumptive character of the evidence relating to survivorship.

# DEATH FROM COLD, HEAT, AND STARVATION

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## DEATH FROM COLD AND HEAT

**Physiologic Considerations.**—Both cold and heat are capable of inducing fatal effects when applied to the animal body, and for the most part the mode of action is the same in each case. The deleterious influences may be regarded as partly exerted upon the vascular apparatus and circulatory function, and partly as due to the action of toxic principles generated within the body under the circumstances of its abnormal environment.

It cannot be stated distinctly how these vascular influences are induced, but it is safe to say that circulatory faults may be produced in either case in part directly, partly through nervous reflexes, and partly by the toxins just mentioned. These toxins, of whose actual nature definite information is yet to be had, are partly those which are naturally generated by the animal body and retained by reason of the impotency of surface excretion, partly the result of local degeneration of tissues influenced by the cold or heat, and partly the result of a general functional derangement induced by the abnormal temperature of the body and vascular derangements consequent to the same.

The temperature of the human body in health is subject to variation from the position of thermometric application, age, time of day, condition of bodily nutrition, exercise, personal peculiarities, and other minor factors. It is least upon the surface of the extremities ( $35.3^{\circ}\text{C}.$ — $95.5^{\circ}\text{F}.$ ), less upon the open surface ( $35.5^{\circ}\text{C}.$ — $96^{\circ}\text{F}.$ ) than in protected situations, as in the axilla or perineum ( $36.6^{\circ}$ — $37.1^{\circ}\text{C}.$ — $98^{\circ}$ — $98.8^{\circ}\text{F}.$ ), and highest in the accessible cavities, as the mouth, vagina, or rectum ( $37^{\circ}$ — $37.6^{\circ}\text{C}.$ — $98.3^{\circ}$ — $99.8^{\circ}\text{F}.$ ). At time of birth the temperature of the infant is one or two degrees above that of the mother, but it falls rapidly to near the average. In old age again the temperature is apt to be slightly above normal. It is higher in the evening than in the early morning, the daily variation being from  $1^{\circ}$  to  $1\frac{1}{2}^{\circ}\text{F}.$  as an average. As a rule, full body vigor is coincident with slight excess of body temperature over low states of nutritional excellence; and the flush of exercise is marked by a slight rise of temperature. There are also persons who normally present slight variations above or below the average normal temperature of the axilla ( $37^{\circ}\text{C}.$ — $98.3^{\circ}\text{F}.$ ).

Precisely how this normal temperature is produced and preserved is not thoroughly understood. Fundamentally it is probably the result of chemical activities going on in the blood, glands, muscles, and, to a less extent, other parts of the system; these chemical changes being mainly those of oxidation, that is, the union of oxygen with carbon and hydrogen to form carbon dioxide and water; other and more intricate chemical changes are unquestionably largely concerned, particularly hydrolytic cleavage. The chief source of heat lies in the potential energy of the ingested food. The different tissues of our body give off heat in direct proportion to the intensity of their metabolism. The blood and lymph stream are the conductors of the generated heat. This generation of heat is to a greater or less degree regulated by a thermogenic mechanism situated in the spinal cord, medulla, and basal cerebral ganglia. Both heat-accelerator centers and heat-inhibitory centers have been localized, but the evidence at hand does not as yet permit us to draw conclusions of their exact location or function. The dissipation of heat takes place mainly from the surface of the body by radiation, convection, and absorption in the evaporation of the sweat; it is also lost by convection from the lungs; and in the form of bound or latent heat in the renal and intestinal excreta. In the rate of loss by all these means much depends upon the temperature of the surrounding medium, as favoring or not one or more of the modes of dissipation. Thus a cold surrounding atmosphere permits the direct radiation of heat from the body, gradually diminishing with rise of surrounding temperature and ceasing when the atmospheric temperature approximates that of the body.

Convection is favored by the coincidence of moisture and lowness of the temperature of the surrounding atmosphere, the cool particles of moisture abstracting heat from the warm body to their own evaporation. Motion of this cool moist atmosphere augments its refrigerating power by constantly bringing to the body surface fresh, cold particles of moisture to abstract further heat. Thus is explained the chilling power of cold winds in moist climates. Convection is favored also by a high temperature of the surrounding atmosphere, coinciding with dryness of the air, such a combination permitting free evaporation of the perspiration poured forth upon the skin surface, and easy absorption of moisture from the lungs by the air inhaled. A combination of such conditions prevailing, comparatively high degrees of atmospheric temperature may be withstood with little discomfort. Far less animal heat is lost by convection in a cold dry air than in a cold moist air; and a warm moist atmosphere decidedly retards the cooling influence of perspiratory evaporation, thus increasing the discomfort of warmth to the body.

The amount of air inspired, its temperature, and its humidity likewise influence in distinct measure the rate of the heat dissipated; the amount and temperature of liquids and solids ingested, by adding or abstracting heat from the body, must also influence the rate of heat loss.



In addition to these there probably exist in the central nervous system, in much the same situations as the heat generative centers, other centers which inhibit the production of animal heat and thus aid in maintaining the heat balance at a uniform degree. Further, as influencing most materially the rate of heat dissipation, the amount and character of clothing must be kept constantly in mind.

**Influence of Cold and Heat Applied to the Body Surface.**—For the present consideration, by far the most important primary influence in the production of deleterious effects is that exerted by the temperature upon the rate of heat dissipation through the skin. Such are brought about mainly by modifications in the circulation of the surface. Increases or diminutions of thermogenesis and toxic development enter secondarily but probably in important degree in the later manifestations of individual cases. The effects of local application of cold or heat to the surface may be taken as an indication of the effects of similar temperatures generally applied, and may be used in explanation of the lethal effects produced.

If the hand, for example, is thrust into an icy temperature, the primary result is a stimulation of the pilomotor apparatus, of the muscular fibers close to the surface, and consequently a constriction of the vessels of the skin. The surface becomes blanched, the skin compact, "goose-flesh" appears, the surface becomes numb; the blood is driven from the surface exposed to the cold, and to a certain degree loss of heat by absorption from the warm blood prevented. A longer exposure is followed by a diffuse reddening of the exposed surface, as the blood returns to the part in increased amount, either as the result of a nervous reflex, from the stimulation by the cold leading to a dilatation of the vascular apparatus of the skin, or as a direct paralyzant result of the cold upon the tissues and vessel walls of the exposed part. Temporarily this increase of warm blood coming to the chilled surface tends to preserve the temperature balance of its tissues and maintain their integrity; but with the continued and increased loss of heat to the external cold medium such balance is eventually again destroyed, and the tissue elements altered to a greater or less degree. If the part exposed is a dependent one, the blush thus induced advances in its intensity, by a gradual paralysis of the vessel walls, to a cyanosis or deep congestion, with consequent tumefaction, tingling, and pain, or, in advanced degrees, actual anesthesia. If, however, the surface is readily drained, the blood again gradually recedes to the interior, to occupy the larger vessels and capillary areas of the internal viscera, and the surface remains white and the part unswollen. If attached to the living body, such a congested part in its reaction becomes the seat of more or less intense inflammation or gangrene; while in case of actual destruction of the tissue, in the severer forms of exposure to cold, the inflammatory reaction is limited to the area of demarcation between the necrotic and the living part. In case of death by freezing, the blood, as noted by various observers, remains fluid, although alterations of a decisive character take place in its constitution. These alterations of

blood constitution probably play a distinct part in the final lethal effect of cold both nutritively and in the capacity of oxygen convection; also in the development of toxic materials.

If the entire body surface, including the lungs, instead of a portion, is exposed to the influence of long-continued and intense cold, there will be noted as a result contraction of the skin, blanching of the surface, superficial muscular stimulation, manifested by shivering and distinct sensation of cold. Succeeding these the surface becomes reddened, a glow of warmth and a sensation of tingling or mild pain develop. This is especially true for the extremities, where the circulation is not so active as in the general system. It is not known whether this blush of the surface, secondary to the primary blanching, is due to a direct or a reflex influence, but it is probably the result of a paralysis of the vaso-constrictor and muscular fibers of the skin in the vicinity of the vessels. This vascular dilatation, thus far noted only in the vessels of the surface, gradually extends, as the influence of the cold penetrates more deeply, to the larger vessels and viscera of the interior, which, in a relaxed state, are competent to contain the entire bulk of the blood of the body. In consequence the blood is withdrawn from the surface to the interior, thus leaving the skin blanched, and the interior vessels, including those of the brain, completely filled. Such conditions are found postmortem. Other factors, however, are also to be sought for in the production of the cardiac failure which usually terminates life, since in most instances the degree of internal congestion is insufficient to account mechanically for the cessation of circulation, and to explain other phenomena uniformly found. An important influence is probably exerted by various poisonous principles which exist in the blood and tissues in consequence of the inability of the bloodless skin to perform its usual excretory function, as well as in consequence of direct metabolic changes in the fluids and tissues which are under the influence of the cold. The importance of the skin excretion is well shown in the frequently quoted experiment of varnishing the skin of a lower animal with an impervious covering to prevent the escape of the excretory products. Under these circumstances death usually occurs in the course of some hours, with symptoms of implication of the nervous system. The fluidity and bright red color of the blood; the heightened internal temperature of the earlier stages, indicating increased chemical changes; the constant tendency to somnolence and coma (Mosso has shown that certain conditions of the blood of fatigued animals may, by transfusion, transmit the tendency to sleep to the receiving animal), all point to the development and active participation of such poisonous substances. Their nature is, however, as yet undetermined.

Compared with the effects of cold, the action of heat bears a marked similarity, differing only in minor details of the vascular phenomena. Local exposure of the surface to an intense heat causes at first a brief period of contraction, which is rapidly followed by relaxation. This manifests itself by a diffuse blush, which may again, if the blood remain in the part, proceed to a deep congestion, inflammation, and gangrene.

This last, in local burns, just as in local freezing, may be attended by formation of blisters or may proceed to a more rapid tissue destruction, as in the production of eschars or chars. Applied more slowly and in less intense degree, the vascular dilatation gradually extends to the vessels of the interior, and the surface, if easily drained, becomes bloodless. Thus, in the effect of general exposure to heat, the same phenomena occur, the primary period of blanching being little marked or unnoted; later the surface becomes generally reddened, and, owing to the hyperemia, the sweat-glands become stimulated to profuse activity. The evaporation of perspiration for a time exerts a refrigerant action and tends to preserve the heat balance, but if evaporation is impeded by the humidity of the surrounding atmosphere, the final effects of the heat are accelerated. Or, after a time, from excessive activity, the function of the sweat-glands becomes, as it were, paralyzed, and the dilating influence of the heat is felt more and more centrally. The blood is thus permitted to proceed from the surface of the body to the interior, and the same train of symptoms is induced, with the same final consequences of circulatory failure and death, as in the case of application of cold. Here, also, probably the same important rôle is played by a number of unknown toxic principles arising within the body, naturally or under the influence of the heat exposure, and prevented free escape through the skin because of the failure of perspiration. This additional feature, however, marks the development of the lethal effects of heat. The animal heat, increased as it is by the chemical activities leading to the formation of toxins and under their influence, as well as through central nervous influence, failing of its proportionate dissipation, increases rapidly and extremely in these cases and constitutes one of the most important features of death from heat exposure.

#### DEATH FROM COLD

The degree of cold required to produce death must vary widely in individual cases, depending upon the natural and artificial powers of production and conservation of heat possessed by the individual. Degrees of temperature very insufficient actually to freeze the tissues or fluids of the body may, under proper combination of person and environment, suffice to lower the body temperature enough to determine death. On the other hand, an individual in free vigor, with proper nutrition and a sufficiency of suitable clothing, may withstand degrees of temperature as extreme as  $-73^{\circ}\text{C}$ . ( $-94.4^{\circ}\text{F}$ .) with comparative impunity, at least for a limited period of time. Experimental studies on the subject have shown that it is impossible to fix a definite degree of temperature at which death will invariably take place. As in most instances of ordinary illness, a depression of body temperature of but a few degrees ( $4^{\circ}$  to  $10^{\circ}\text{F}$ .) is regarded as more or less prognostic of death, although there are isolated instances in which very much greater depressions have been recovered from; so, also, in case of exposure to cold, while death may sometimes in the weak or aged be induced by refrigeration to but



a few degrees below normal, yet there are recorded instances of recovery where the accessible cavity temperature was as low as 75° F. or lower. It is, therefore, impossible to predicate that death from exposure to cold cannot take place because the temperature of the surrounding atmosphere or other medium is not at or below 32° F.

Infants and the aged are particularly liable to the untoward effects of such exposure, having little reserve of thermotaxic power. Owing to the low conductile influence of a greater deposit of subcutaneous fat, woman is able to preserve her body temperature more readily than man, and is, therefore, other things being equal, less liable to death from the cause in question. This statement must be accepted, however, with reservation, the modern protected, artificial life of females reversing in great measure their natural advantages. Persons of slight bodily vigor, persons of spare build, persons whose vitality has been impaired and whose temperature balance is deranged by disease, or who have, from vascular or cardiac disease, little circulatory tone, as well as those who, from traumatism or operation, have suffered from cardiac failure, collapse, or severe hemorrhage, are predisposed to the effects of cold and withstand its influences less strongly than normal individuals. Persons who eat but little or mostly of vegetable food are less likely to withstand refrigeration than full eaters and those who habitually eat meats and fats; and it is well known that starvation and death by freezing are apt to be coincident. The popular use of alcohol to sustain the body temperature during exposure is based on fallacious ideas, and habitual alcoholism is a very important predisposing cause in the occurrence of death from cold. Alcohol excites a sensation of warmth by temporary stimulation of the circulation, thus bringing warm blood to the chilled surface; but by thus aiding in heat dissipation it merely hastens the fatal result. Its only possible use is a temporary one, and it should never be employed where any but a transient effect is desired. The drunken stupor, with its weakened circulation, is a state especially fraught with danger in case of exposure. Other beverages and drugs having a temporary circulatory stimulative power produce only a false sense of benefit. Coffee and tea belong to this category, although the heat of the liquid in which they are diffused is here of material value in restoring to some extent the lost somatic temperature. So, also, drugs having a depressing effect upon the circulation favor the action of cold.

The influence of clothing in the maintenance of the body temperature is of great importance, in that this constitutes the most potent artificial factor available to man to prevent heat dissipation from the surface. The main value of clothes depends on the amount of warm air which they are able to retain in contact or close to the skin rather than the degree of warmth attained by their own fabric; and it thus follows that a given weight of material disposed so as to maintain several layers of warm air between the skin and the external cold is more efficient than when arranged as a single layer. In material, porosity and small power of hygroscopy determine the warming excellence of clothing.



The air spaces of such textures retain in a measure the air warmed from the body surface. The small amount of moisture present prevents much loss by absorption to the evaporation of the moisture. The color of the goods employed also exerts a slight influence. A light colored material reflects most of the warmth from the external sources and is of no material advantage in lowering radiation; while darker materials absorb heat from every available external source and have little power of reflection. For purposes of warmth, then, a number of layers of loosely woven woolen garments of a dark color stand first in order of efficiency; while the closely woven white cotton or linen goods have least protective power. During sleep, during which period heat genesis is decidedly low and heat dissipation free, the amount of clothing should be greater than during the moments of wakeful activity—perhaps one-third more clothing being desirable during slumber than when the individual is awake. It is of interest, finally, to note, in cases exposed to cold, that the posture of the body will, to a certain extent, determine the rate of heat loss; extension of the members and consequent exposure of a greater dissipating surface hastening the effect; while a contracted posture, with arms and limbs arranged close to the trunk, by diminishing such area, retards to a greater or less degree the rapidity of the process of freezing.

**Symptoms.**—The onset of symptoms depends largely on the particular mode of exposure. Thus the ordinary freezing to death which occurs from prolonged exposure to low atmospheric temperature is gradual in the development of its symptom-complex, while a sudden immersion in cold water is generally quite rapid in its effects, a few minutes' exposure often being sufficient to induce unconsciousness. In persons of vigorous constitution the course of symptoms is apt to be more protracted than in those weakened from various causes. In this latter class a rapid, paroxysm-like culmination may occur after but a few minutes, resembling the so-called "congestive chill." It is to be insisted, also, that death from exposure to cold is not always immediate in its effect, and that the bodies of those thus dead need not always be found in an exposed situation. A weakling, for example, may be subjected for a time to the influences of an intense cold, be rescued, and develop the lethal symptoms of exposure some time after protection has been afforded. An insane person may be immersed in an icy bath for its calmative effect, be removed and warmly covered to induce proper reaction. This reaction may never come, although the fatal circulatory failure is not distinctly recognized until hours after the bath.

In ordinary cases of exposure to cold, exposure to the cold atmosphere, for instance, the first feature noted is the subjective sensation of cold, most pronounced, as a rule, in the extremities, lips, nose, and ears. The surface at first becomes pale, the skin contracted and harsh, and "goose-flesh" appears from the stimulation of the pilar muscles. The irregular stimulation of the superficial muscles gives rise to the well-known creepy sensations and to shivering. If at this time the surface and the deep temperature are taken, while the former is found below

normal, the latter is usually one or more degrees above the normal. This condition has been thought to indicate an increased thermogenesis, probably from the active chemical changes induced within the system under the influence of retained excretory materials, but it may also be explained by the marked contraction of the cutaneous capillaries with consequent engorgement of the internal viscera. Indeed, the resulting congestion of the lungs, brain, and other organs may be sufficiently great to cause death. Usually, however, the cerebral congestion causes the individual to be somewhat exhilarated, active in thought and movements, and seeking to stimulate the circulation by free motor exertion. Gradually, as the exposure continues, the sense of chilliness is lost, the blood returns to the skin, for the cutaneous vessels now become dilated, and the surface is covered with a diffuse blush; the "goose-flesh" disappears, the skin becomes smooth and apparently slightly swollen, and the tendency to shiver and the desire for active movement are gradually lost. The dilatation of the peripheral vessels may be so great, because of paralysis of the vasoconstrictors, that the internal viscera are drained, and cerebral anemia results, which accounts for many of the latter symptoms. The chilly sensation is replaced by a tingling or sense of actual pain. The urinary excretion, which during the early stage, on account of the heightened blood-pressure, was increased, is now normal or perhaps diminished. If the temperature is again taken, the surface heat is found to be subnormal, although to a less degree than in the previous stage, while the internal temperature is maintained at least slightly above normal. Gradually the blush in the extremities and other distal parts of the circulation deepens to a purplish, cyanotic hue; but after a time the dilatation of the internal vessels permits the blood to recede from the general surface, leaving it blanched and relaxed. Even the surface of dependent parts may be left pale and bloodless in this terminal stage, although if the onset of the internal relaxation and circulatory failure is rapid, such dependent surfaces are generally left livid by the retention of blood in their structures. Various circumstances of protection, of local muscular contraction, and other causes may likewise retard the recession of blood from this or that part, giving rise to livid blotches of irregular size, shape, intensity, and disposition. Generally the hands and feet, nails, nose, lips, and ears remain blue and livid, and should recovery take place, intense inflammatory reaction may set in or gangrene develop from the intensity of the passive hyperemia. The tingling and pain of the preceding stage gradually disappear, to be replaced by numbness, deepening into actual anesthesia. During this third stage the somatic temperature, both internal and external, rapidly falls to approximate that of the surrounding medium after death. The pulse, which hitherto may have shown no appreciable change, is distinctly soft and weak, and may be altered in rate and rhythm, indicating cardiac labor and weakness. A sense of oppression and fulness may be complained of about the chest, if the patient is able to appreciate his sensations; and a slight irritative cough often develops quickly, with a frothy and sometimes bloody

expectoration. The general sensibility of the patient is progressively and greatly changed. A feeling of weakness and fatigue appears, the intellect becomes dulled, there is indisposition to further physical exertion, and a drowsiness steals over the individual's senses. The feeling of tiredness becomes overpowering, and although the patient may appreciate his position and danger, utter carelessness as to the result is manifested; the somnolence grows apace, and in spite of every stimulus the victim sinks into a sleep which soon deepens into coma, and, without help, rapidly passes into death. Sometimes in this unconscious state, or replacing it, epileptiform or apoplectiform convulsions occur and terminate the scene. Death usually occurs gradually by cardiac failure, but a syncopal attack may prove the terminal stage; and at times the respiration ceases before all signs of circulation have disappeared. Erythrocytic destruction and action of cold on the nervous tissue are probably also in part responsible for the fatal termination. Finally, there must be mentioned certain important chemical blood changes. Cold retards the absorption of oxygen by the tissues, and heat is required for the dissociation of oxygen from hemoglobin; both these factors will lead to a profound suboxygenation and undoubtedly to profound metabolic disturbances.

Rigor mortis appears at various periods after death, largely depending upon the physical exertion performed before death; but, as a rule, true rigor mortis appears slowly. Rigidity from congelation may mask that produced by the usual coagulation of the muscular substance.

The time occupied in the process of freezing to death, as already stated, varies considerably, but usually several hours are consumed before the termination is reached; and in vigorous subjects the different stages will require an exposure of a number of hours, if a fair protection has been possessed by the individual, before death takes place. Immersion in cold water, exposure to cold air and dampness combined, as in wet clothes on a cold day, other things being equal, produce more rapid and serious effects than exposure to a cold but dry atmosphere alone. The personal resistive power is also of much importance; weaklings from any cause succumbing with much greater rapidity than persons possessing an ordinarily strong constitution. Thus it is not improbable that quite a decided proportion of the deaths which occur rapidly some hours after a severe operation, without apparent cause, are in reality due to the influences of a temperature perhaps but little below that customarily endured; and in localities subject to sudden and decided changes of temperature, as in our Gulf States in winter, hospital officials fear greatly the sudden oncome of a "norther" lest their weaker patients may succumb from the change of temperature occurring even in a protected ward.

**Postmortem Appearances.**—The appearances met in the body after death from cold are few, but are fairly distinctive where the exposure has been to actual freezing temperature, and may serve to determine with some accuracy that death has occurred by reason of such exposure. In such cases the surface of the body is extremely pale;



but here and there, not merely in dependent parts, livid blotches, such as are usually seen in ordinary death in the dependent parts of the surface, may be found. These patches of lividity have no regular position, shape, size, or depth of hue; and may be entirely absent. The lips, ears, and terminal phalanges are usually blue. The skin, especially about the thicker parts, as the palms and soles, is apt to be wrinkled. There is nothing characteristic about the posture of the body, unless it is found in a curled-up position indicating some effort on the part of the victim to preserve his warmth before becoming unconscious. The pupils are dilated. There may be a little bloody and frothy mucus in the mouth and throat.

On opening the body, the interior vessels are found full of blood, and the larger viscera, including the brain, but sometimes excluding the lungs, are found deeply congested. Patches of hemorrhage, from extreme engorgement probably, have been noted by some observers in the gastric and intestinal mucous membrane. When the lungs are engorged, it is not unusual to find small hemorrhages and submucous effusions in the bronchial tubes. Occasionally, also, small hemorrhages into the uriniferous tubules of the kidneys are to be found. The brain is occasionally also the seat of small hemorrhagic patches, thus accounting for the apoplecticiform seizures sometimes met with in the terminal stages. The heart is distended in all its cavities. The appearance of the blood is peculiar, being of a light arterial hue and much more fluid than ordinarily is the case after death. Small clots are often found in the heart cavities and larger vessels, but the fluidity of the blood is a uniform characteristic. Brownish or yellowish-brown, softened patches are sometimes found in the muscles of the abdominal wall and in other muscle groups. They appear like the areas of hyaline or coagulation necrosis encountered in typhoid fever and other infectious diseases. Some observers have commented on the bursting of the cranial sutures, especially in infants, due to the expansion of the brain during freezing. This is, however, a postmortem alteration, and may occur in cadavers exposed to extreme cold.

These changes are met with uniformly only in those who actually "freeze to death," and are not so generally met with in those whose death has occurred without such prolonged exposure to an intense cold, as is presupposed in these cases. Thus infants, who succumb earlier and from less intense cold than ordinary adults, are very apt to have more wide-spread lividity of the surface of the body, death having taken place from circulatory failure before the usual determination of the surface blood to the interior had been completed. So, also, in persons whose condition of vasotaxis was poor even before exposure, and who, in consequence, probably died in syncope after brief exposure, the surface appearance is that usually met in ordinary deaths—moderate degree of pallor of superior areas and lividity of dependent ones. In these latter, also, the arterial hue of the blood and failure to coagulate is not noted with any certainty.

Of the appearances given, while as a group, taken into consideration



with the surroundings of the case, they constitute a fairly certain evidence of the mode of death, none is absolutely sure. A number of poisons, for example, among them prominently the cyanids, are capable of producing the fluid consistency and arterial hue of the blood; while a large number of toxic agents and disease conditions might duplicate the internal congestions noted. The irregular livid patches upon the pallid surface are probably most nearly certain evidence of the influence of cold, and yet these are not by any means constant and may be closely simulated in various states of poisoning and disease. They are probably most often caused by some interference to the determination of the blood from the surface to the interior in the onset of the third stage of the process. Thus the compression of an efferent vein by some external pressure, by some pressure from posture, or by some irregular constriction of a neighboring muscle could well account for the phenomenon.

In the examination of bodies of those supposed to have died from the effects of exposure to cold it must not be lost sight of that death may have occurred from very different causes, and even in the existence of the foregoing signs careful examination of the body for signs of other disease and of violence must be made. Persons freezing to death seek naturally, as a rule, a sitting or recumbent posture as a relief from fatigue, and marks of violence are therefore always to be regarded with much suspicion when found in such cases. The marks of violence need not be of such a character as to indicate a necessarily fatal violence in order to implicate another, since it is well known that in the wounded refrigeration is more uniformly and seriously effective than in the normal. Nor is it to be lost sight of that mere frozen rigidity is not in itself an indication that death occurred from cold, since, of course, solidification from freezing cannot, in the nature of things, occur generally throughout the body until after actual death—and this in spite of the fact that cold-blooded animals, as fish, may sometimes be resuscitated after having been frozen stiff, and that small portions of warm-blooded animals, cock's-combs, for example, may become brittle from cold, while the animal retains its vitality. A matter of some importance, indicated in the writings of various legal physicians, is the absence of all signs of putrefaction, and from this the inference arises that if congelation has been continuous, any such signs must indicate the death of the individual prior to the freezing of the body. Yet it is to be recalled that an actually freezing temperature is not always necessary to produce death from cold, and that slight putrefaction may occur in temperatures sufficient to produce death in the weak. Moreover, the occurrence of weather permitting decomposition in the interval between death and the discovery of the body must be kept in mind.

**Treatment of Those Dying from Exposure to Cold.**—The indications for the care of persons in whom death from cold is imminent include the preservation of the remaining body warmth, the provision, in every way possible, of warmth to make good the loss which has occurred, and the maintenance and stimulation of the flag-

ging circulation. After immediate reaction has been obtained, the subsequent measures should be directed to overcome the more or less persisting effects of the wide-spread internal congestion, especially of the kidneys, alimentary tract, lungs, and brain, and the establishment of full excretion and of nutrition. The first of these indications demands the immediate application of a large amount of light, non-conducting clothing. The patient should immediately, or as quickly as possible, be placed in a warm bed. Hot diffusible stimulants should be administered, and hot bottles and other external heat applied to the surface. The skin should be thoroughly rubbed with hot towels. Among the stimulants indicated, whisky, strychnin, hot coffee or tea, and digitalis are probably the best. Hot saline enemata may be administered with benefit. The body should be placed in such position that determination of the blood from the brain will naturally occur; but with any sign of syncope the head should be lowered at once. After the reaction has been established, the further treatment of the case resolves itself into that of the nephritis and other inflammations which may arise, and must necessarily vary greatly with the intensity and special prominence of the involvement of this or that organ. In every case, however, the necessity for the care of the nutrition and the establishment of free renal and dermal excretion must enter largely into the special treatment, in order to afford the means of maintaining the chemical activities upon which thermogenesis depends and in order to free the system of the deleterious products which have formed or accumulated during the period of refrigeration.

**Legal Considerations.**—Death from exposure to cold is usually accidental, but questions of responsibility may arise as to homicide in exposure of babes, children, the insane, or the aged, and of contributory negligence in the case of weaklings and sick and wounded persons. Intentional exposure or criminal negligence can naturally rarely be charged in connection with healthy and developed individuals, nor is the possibility of suicide by the means in question of sufficient importance to demand attention. Instances of intentional destruction are not infrequent, however, especially in the newborn, particularly when the child was illegitimate. In such suspected instances it is to be kept clearly in mind that babes, and especially those prematurely or poorly developed, may perish from comparatively slight refrigeration, and that it is not necessary to establish the prevalence of actually freezing weather during the exposure. The environments of the mother at the time of parturition are, however, to be considered, inasmuch as she may have been at the time physically unable to render the necessary attention to her offspring; yet in such event she may be held liable to the charge of contributory negligence for failing to provide the assistance usual to childbed in civilized communities. In infanticide by exposure, further, a systematic incompleteness of protection from cold may procure the desired death of the babe, and yet at the time of actual death the surroundings be free from objection, death occurring from failure to react from the effects of previous partial or complete exposure. Death from

intentional or ignorant exposure by immersion in cold water has been known in case of such infants and children.

Among the insane, incarceration in cold rooms or other insufficiently protected places, and the enforced use of cold baths have occasionally resulted in the death of the patient. The actual motive of murder is usually absent here, the exposure resulting from carelessness or ignorance. Sometimes, in asylums and elsewhere, the cold bath is used by unthinking or unscrupulous attendants for purposes of punishment of some refractory inmate or for its calmative after-effect, and death has been known to occur in consequence. As a rule, however, in well-regulated institutions for the insane such an act is beyond the right of the nurses; and where the power is usurped without the authority of the physician in charge, the attendant should be held legally and fully responsible. So, also, for the aged, the sick, or the wounded, criminal or ignorant failure to protect against cold may directly, or by causing serious complications, lead to deaths and give origin to legal inquiry. In all these cases, especially when the intentional exposure or the ignorant neglect is sought to be concealed, the caution already mentioned must be emphasized, that the full category of postmortem signs already mentioned is likely to be absent; and the interests of right demand that such failure to establish fully the evidence of complete congelation shall not be held to invalidate the charge if sustained by other evidence. The postmortem evidences enumerated more frequently are discovered in their full complex among those accidentally frozen than among those dead from intentional or careless exposure to cold.

Finally, the question of contributory negligence may be held against physicians and others responsibly in attendance, from failure reasonably to practice the measures indicated for the relief of those threatened by death from exposure to cold, without justification of special circumstances.

#### DEATH FROM HEAT

Exclusive of the effects of burns and scalds, heat may produce lethal effects by what is commonly known as **sunstroke**, **heat-stroke**, or **thermic fever**. This condition, presenting several different phases, usually occurs from exposure to the direct rays of the sun, but may be induced by exposure to any excessive external heat if of sufficiently long duration, as, for example, in the boiler room of ships, especially when in tropical waters. Cases of fatal heat-stroke most frequently occur where, in connection with the direct influence of the heat rays, an insufficient amount of atmospheric circulation prevails, especially if the air is humid enough to retard the evaporation of perspiration to an appreciable degree.

In the action of heat, as in that of cold, several stages of severity may be distinguished, and there are at least two modes of manifestation of the fatal stage. As in case of cold, the very young and the very old, the sick, the weak, and the wounded first feel the effects of



exposure of the general system to excessive degrees of temperature, and it is, therefore, among these classes that, as a rule, the milder stages of thermic fever are brought to notice; while in the strong, these early signs unnoted, the process is permitted to proceed to the fullest manifestation of heat collapse or of the febrile form of *coup de soleil*.

The effects of heat in milder degree are held by many to be the cause of at least a large proportion of the deaths from cholera infantum among the infants of large and hot cities during the prevalence of the heated term. The male sex among adults is more frequently affected than the female, mainly because the latter sex is less liable to prolonged exposure to excessive temperatures and bodily fatigue. As a rule, the inhabitants of cooler climates, upon immigration to a warmer zone and until they have become acclimated, are more subject to the evil effects of heat than the natives; and thus it arises that generally the dark skinned races are comparatively exempt from the severe results of such exposure. Fatigue, both muscular and mental, but especially the former, seems to increase materially the liability to the untoward effects of exposure to high temperatures. The high rate of occurrence and fatality of heat-stroke among armies on the march or in battle is probably largely dependent on this factor. Heavy and warm clothing, as the uniforms of soldiers, may be an important element. Intemperance is generally placed among the first of the etiologic influences, and clinically this claim seems well sustained; but there are those who regard it as but a minor agent. It is held by these latter that the habit of intemperance and physical exertion leading to fatigue are coincident in the laboring classes, among whom heat-stroke is most commonly encountered, and if the intemperate of the richer classes were also subject to great bodily fatigue during exposure to heat, the results would be proportionate in the two groups. There is, doubtless, some truth in this contention, but theoretically one would expect that the vascular alterations consequent upon prolonged habits of intemperance would decidedly favor the circulatory failure in insolation. The insufficient intake of water also favors the production of hyperthermy. Corpulence and hypoplasia of the chromaffin system are other predisposing factors.

The severe manifestations of heat exposure usually occur during the periods of greatest physical exertion in the hot hours of summer days; but when the nights are also hot, the phenomena of the condition induced may present themselves during the hours of rest. Exposure to the direct rays of the sun is most frequently productive of the untoward effects, and by far the greatest number of cases occur in those working in the heat of closely built cities of the coast without the favoring influence of free breezes. Yet protection from the sun's rays by no means grants immunity, for a large proportion of the severe cases takes place in hot, close manufactories, furnace-rooms, and similar buildings. The degree of heat requisite to cause pathologic effects must of necessity vary much with the thermotaxic power of the individual and with the relative humidity and movement of the surrounding



atmosphere. In closely built cities, in moist climates, heat-strokes are apt to appear when the thermometer registers from 80° to 85° F. and upward; on dry western plains, where the atmospheric movement is free, sunstrokes are not common even when the heat of the sun registers as high as 115° or 120° F. Brief exposure to much higher temperatures, as in fire-rooms of great ocean steamers, where the thermometer is known sometimes to register as much as 160° F., is possible without material injury if free circulation of air is provided. The degree of habituation toward high temperature as well as individual susceptibility play an important rôle.

The injudicious use of water by those exposed to excessive warmth may prove dangerous. As a rule, where no physical exertions have been coexistent with the heat exposure, the drinking of cold water is not injurious, but aids in lowering the body heat; but carelessness in drinking large amounts of iced liquid by those who are overheated and fatigued has been known to produce sudden death. It is, however, advisable that small amounts of cool liquids be drunk from time to time, both for the immediate effect of cooling the parts with which it comes in contact and in order to promote free perspiration. Sudden immersion of the heated body, as in the cold plunge of a Turkish bath, when there is no element of fatigue attending, is, as a rule, refreshing and invigorating in health; but the same practice after overheating by severe labor in a heated atmosphere has frequently produced fatal consequences.

**Symptoms.**—Aside from such poorly understood influences of excessive heat exposure as are believed by many to underly at least a number of cases of cholera infantum or summer sickness of children, there are three fairly distinct trains of symptoms arising from such exposure. The first of these is to be regarded as a mild form of ordinary thermic attack, and has been described under various names, as **simple continued fever, ardent continued fever, hyperthermy**, and has been confounded with various acute febrile affections—as, for example, typhoid fever. This phase of thermic fever may run a varied course—from several days to a week or more. The attack usually comes on rapidly, sometimes with a chill and transient pallor of the surface; the fever quickly rises to 103° or 105° F., and in severe cases may be more intense. The face, and often the body, is generally covered with a diffuse blush. Headache of more or less intensity is complained of; there may be intolerance of light and sound, and, in the severe forms, delirium. There are anorexia, nausea, and vomiting; either diarrhea or constipation may be present. The patient voids but a small amount of highly colored urine. The pulse is generally full and hard; respirations are rapid and rather shallow. There is considerable prostration, malaise, and usually more or less muscular pain. The carbon dioxid content in the blood is increased, indicating acceleration of metabolism. As a result thereof, more or less pronounced emaciation follows. In the United States the condition is apt to be of short duration, and gradually subsides in a few days. In the severer forms, such as are

met with in India, the attack is often fatal, passing into coma and death in three or four days, and sometimes terminating in apoplectic-form convulsions.

The second form is that known as **heat collapse**. It is not often seen in this country in its most typical development, but is represented by the common **heat exhaustion** occurring among laborers in the height of the heated term, and is especially likely to occur in persons unaccustomed to heavy work who endeavor to perform an arduous physical task under such circumstances. This milder form of heat exhaustion comes on gradually at first. The subjective sensation of heat becomes intense, the perspiration scanty, the countenance flushed; there is throbbing pain in the temples, and the mouth is dry. After perhaps half an hour of such experience there is felt an uncertain weakness about the epigastrium, cardiac palpitation may be noted, the surface becomes pale and is bathed in perspiration, and chilliness and great muscular weakness cause discomfort. The headache rapidly diminishes, nausea and vomiting may come on quickly, and the patient may have intense griping and urgent and repeated desire to defecate, with the evacuation of profuse watery, sometimes bloody, passages. Rest in the recumbent posture, quiet, some simple cardiac stimulant, and a mild astringent will, as a rule, in the course of a few hours, or a day or more at most, accomplish the desired cure. The grave form of heat collapse is far less frequent, but is by no means unknown in this country. It may develop from the milder form just described, or may occur without appreciable warning. The patient may, in the midst of his work, be suddenly seized and fall unconscious. The surface is pale, is bathed with profuse perspiration, and feels cold to the touch. The pulse is rapid, feeble, and irregular; the temperature, taken in the mouth or rectum, is subnormal. Unconsciousness is often incomplete, and may be accompanied by a low muttering delirium. Such a case, if left to itself or if remedial measures fail, will die from cardiac failure or occasionally from respiratory failure.

The third and classic form of heat-stroke is the well-known **sun-stroke, coup de soleil, heat apoplexy, insolation, or thermic fever**. The conditions of its development are the same as of the other forms. Unknown personal factors determine the presentation of this rather than of the other varieties. Usually it is preceded by recognizable symptoms for perhaps half an hour or more before the actual explosion; but it may occur, like the grave form of heat exhaustion, with great suddenness and no appreciable warning. In ordinary cases, after prolonged exposure the patient complains of headache and an uncomfortable subjective sensation of heat. As the external heat is maintained and the individual persists in physical exertion, perspiration becomes less and less marked and after a time disappears. Dizziness is felt, and the feeling of heat becomes excessive. The face and more or less of the general surface become congested; and suddenly, generally, as if shot, the patient becomes unconscious and, if in the erect position, falls. The physician rarely sees the patient before this stage of the illness,

and is frequently unable to obtain any history of the premonitory symptoms described. The surface is almost invariably red and extremely hot to the touch; the pulse is full and bounding, usually rapid, but without tension, while its rate is not increased in proportion to the temperature; the respirations are unaltered or stertorous; coma is usually complete or attended with delirium; and temperature is much elevated, sometimes reaching 112° or 115° F. A peculiar pungent odor is nearly always appreciable; involuntary dejections having this same odor are frequent. The pupils are usually contracted. The patient may lie perfectly motionless as if paralyzed, or there may be marked restlessness, *subsultus tendinum*, or even convulsions. Fatal cases are generally terminated in the course of half an hour or an hour. Occasionally the attack and its fatal outcome are truly *fulgurante*, death taking place from syncope at once. Commonly the temperature in these fatal cases mounts from the initial moderate hyperpyrexia to the maximum, which is, on an average, 108° or 109° F., exceptionally five or six degrees higher, as already indicated. The pulse becomes more and more rapid, losing in its strength and fullness; the respirations become more and more impeded; mucous râles appear in the bronchi and trachea; the surface of the body, by reason of cardiac failure and internal vascular dilatation, becomes pale, and death occurs either from asphyxia of central origin or by rapid or slow circulatory failure. The case may be terminated by apoplectiform seizures.

In addition to such cases it should be remembered that milder forms may be encountered, in which complete or partial consciousness may be preserved, but where the sudden onset and the prevalence of the heightened temperature and of the other symptoms justify a classification among the true sunstrokes.

The differences between these two forms of grave heat injury, while clinically very striking, fundamentally are probably merely those dependent on the point of application of the influences. The typical heat exhaustion manifests a vascular dilatation and relaxation as the main stage of its course, which in the true sunstroke is represented but briefly in the terminal collapse or syncope; while the important period of circulatory stimulation and peripheral hyperemia of sunstroke in heat collapse is of but brief duration or perhaps entirely absent. Heat collapse, then, from a pathologic point of view is really a protracted form of the terminal period of *coup de soleil*, and as such is a more advanced and serious state than the latter. The pallor, the tremendous heat dissipation, leading to a subnormal temperature, the clammy, profuse perspiration are all significant of such an interpretation. Why such difference of result should occur is not understood, but it is probable that any pre-existing cause accounting for lack of vascular tone, absolute or relative, must have some influence in hastening the oncome of the stage of circulatory paresis. Differences in the degree of heat exposure and accumulation of body heat explain the possibility of persistence of such paresis in heat collapse for a longer time than in true sunstroke before fatal termination. On the other hand,



the accumulation of body heat from external sources, from increased chemical changes within, from failure of thermo-inhibitory centers, and from failure of the dissipating influence of the overworked sweat glands should, in the nature of things, precipitate a more serious and therefore more brief period of vascular and cardiac failure, and should terminate life more quickly when once this stage of collapse or syncope is reached.

When in either form a favorable termination takes place, recovery is apt to be slow and attended by periods of relapse; and, as is to be expected from the greater disturbance of thermotaxis in sunstroke, more protracted and uncertain in the latter form. Persons who recover usually retain functional or structural sequels, of which the most characteristic is a great idiosyncrasy to the effects of any form of heat. Such persons are often most uncomfortable in temperatures previously pleasurable to them, are unable to sustain the heat of a stove in winter in the same room with them, and suffer intensely from the heat of summer. They may manifest very protean nervous and vasomotor symptoms, but most frequently complain of headache and vertigo when influenced by heat. Epilepsy and insanity may follow insolation and persist throughout the life of the patient. Meningeal thickenings and adhesions are frequently found as a structural basis in such cases, indicating that meningitis had developed at the time of the original attack.

**Postmortem Appearances.**—As a rule, the surface is pale, with the usual patches of lividity in dependent parts; and as in death from freezing, but not so frequently, there may be areas of lividity even on the superior surfaces. Petechiæ may also be noted, probably as the result of superficial hyperemia and the altered blood crasis. Post-mortem rigidity usually occurs quickly and is of brief duration. On opening the body the interior vessels, as a rule, are found very full, especially the veins; and the right heart is generally distended. The heart, if the autopsy is held early, is found contracted on the left side, probably as the result of marked and early contraction from coagulation of the muscle protoplasm; but if the autopsy is postponed for much over an hour after death, this contraction is not to be noted, and the heart is flabby and relaxed throughout. The endocardium and intima of the vessels often show areas of reddish discoloration from staining with diffused blood-pigment. The blood shows little tendency to clot, and is dark and fluid, sometimes almost gummy. The most notable alteration is in the plasma elements, the fluid being frequently stained, its fibrin-forming element altered, and the normal alkalinity markedly diminished. The corpuscles show little change in number or structure, but many are paler than normal. There is marked tendency to assume a crenated form, and there are numerous blood plaques. The white corpuscles are usually slightly increased. Ecchymoses are sometimes found on the pleural and the pericardial surfaces. The lungs are generally somewhat congested; the meningeal vessels are full, and occasionally small petechial patches are found in the brain substance. Very rarely a slight inflammatory exudate may be found in the pia



mater, especially upon the convexity of the brain. Microscopic examination of the cerebral cortex discloses alteration of the Nissl substance of the ganglion cells; of what significance such changes are has not as yet been established. The liver, spleen, and alimentary mucous membranes are congested and soft. The kidneys, as a rule, show little alteration, although occasionally there is slight congestion. When hyperthermy has existed for a few days, parenchymatous and fatty changes are encountered in the principal organs.

Putrefaction appears very early in these cases, and it is held by many that the relaxed state of the heart, invariably met in bodies brought to section some hours after death, should be regarded as a result of such alteration. The writers are not disposed, however, to accept the contracted appearance met in most instances when section is made at once after death as a necessary indication that death must have occurred from other direct cause than heart failure, but would seek to explain it upon the same ground as the contraction of any other unopposed muscle in rigor mortis, the circulatory effort being mainly centered in these cases in the veins and venous side of the heart, which is prevented from assuming the same contracted appearance by the opposition of the large mass of inclosed blood.

**Treatment.**—The treatment of ordinary thermic fever can only in a general sense be of legal interest, and may therefore be dismissed without further consideration. The treatment of the two grave forms of the effects of heat exposure is necessarily as opposite as are the clinical conditions themselves. In heat collapse the great circulatory depression and overdissipation of heat are to be counteracted. For the latter purpose the *hot* bath, followed by the application of dry heat to the surface, and friction of the surface with hot towels or with some stimulant lotion, as *tincture of capsicum*, may be employed. Hot enemata of salines, with alcohol or other stimulant, should also be administered. Hypodermic administration, in order not to disturb the stomach, of digitalis, strychnin, alcohol, ammonia, ether, or other circulatory stimulants, should be given without delay. When convulsions seem imminent, small doses of morphin hypodermically administered are sometimes beneficial.

In the febrile form, or true sunstroke, the relief of the hyperpyrexia is the main indication. As soon as possible the patient should be removed to a cool place, his clothes removed, and external cold freely applied. This is best done by bodily immersion in a tub of water of a temperature of 70° or 80° F., and ice added so as rapidly to lower the temperature of the bath as the case may require. In ordinary cases a temperature of the bath, attained by floating ice, of 40° F., will be found necessary. The patient should be kept in the bath until the thermometer in the mouth or rectum has fallen to about 101° F. or thereabouts, and the surface should be constantly rubbed while in the bath. Usually immersion for from ten minutes to a half-hour is found requisite to attain this result. After removal from the bath the temperature generally falls nearly to normal, but in the course of an hour

or two it rises again. The same process should then be repeated. Constant attention to the patient's temperature is necessary, and thermometric records should be taken every half-hour. As a rule, a temperature of 102° F. or over should be regarded as an indication for the bath or sponging with iced water. Even after some hours of treatment a tendency to paroxysms of fever is shown. These are to be met promptly by the same measures. Sometimes, if meningeal symptoms are marked, the direct application of ice to the head or counterirritation at the nape of the neck may be of value. Occasionally the evidences of cerebral congestion may be relieved by venesection, but the greatest caution in the selection of patients for this measure and care in the amount of blood abstracted are necessary to avoid a fatal result. The administration of antipyrin and other similar remedies is often very beneficial, and the hypodermic administration of a full dose is to be recommended in addition to the foregoing remedies. When the stage of collapse in this form has been reached, treatment is necessarily unavailing, and should be employed as outlined in ordinary severe heat collapse.

**Legal Considerations.**—Death from heat exposure is unknown in homicide or suicide, and these patients, when found dead, are of interest only in a negative sense. The absence of signs of violence, the surrounding circumstances of temperature and weather, occupation of the individual before the probable attack, together with the described post mortem appearances, should lead to at least a strongly probable opinion as to the cause of death. In case of insanity and criminal actions without the usual motive, the influence of previous sunstrokes in causing cerebral structural changes and alienation should be kept in mind. Prolonged exposure to high temperatures, as in the boiler-rooms of ships, or in certain factories, may bring about more or less permanent injuries. Since such exposures under certain conditions may be forced and not by agreement, they may come into the domain of medico-legal interests.

(For **Burns, Scalds, and Death Therefrom**, see page 343.)

#### DEATH FROM STARVATION

Starvation may be defined as the result of total or partial deprivation of food. Such deprivation must be understood to comprehend the question of quality as well as quantity. While in either case the result must be the same, yet from a clinical standpoint the classification of **acute starvation**, from total deprivation, and of **chronic starvation**, from long-continued partial deprivation, should be accepted. Both forms occasionally may be the subject of judicial investigation bearing on questions of homicide, neglect, or accident. Criminal employment of this means of destruction is a comparative rarity before courts of justice, yet the importance of questions raised in such proceedings and the comparatively frequent suspicions of neglect in cases of death attended by great emaciation require that a fairly extended consideration of the matter be made.

A food may be defined as any substance which, after ingestion, is capable of contributing to the growth or repair of the organism or to the development of energy within it. The main elements of an ordinary dietary sufficient to maintain normal life and its functions include, in somewhat variable proportions, proteins, carbohydrates, fats, inorganic salts, and water. Of these, the proteins are efficient mainly in the formation of the protoplasmic matter required in the growth of the individual and in the restoration of waste. The carbohydrates and fats are concerned mainly in tissue breakdown and in the evolution of energy, principally in the form of heat. The inorganic salts are principally of use in their participation in necessary chemical activities in the processes of nutrition, and they likewise contribute in a measure to the structure of the tissues. Water is demanded mainly for the maintenance in liquid form of materials brought to or carried from the different vital elements of the body, and contributes largely to the constitution of these cellular elements. In addition to the correct types and quantities of foods, certain accessory food substances or *vitamins* are necessary for the proper maintenance of health. Three kinds of vitamins are at present defined, as: 1, Fat-soluble substance, A, which is present in butter and many fresh vegetables, and essential to growth. Its absence leads to such developmental disturbances as rickets; 2, water-soluble substance, B, contained in the outer parts of most grain, in eggs, yeasts, etc. This is sometimes spoken of as the anti-neuritic substance. Its absence leads to the production of beriberi; 3, antiscorbutic substance, present in fresh vegetables, and to some extent in meat and fresh milk. This is destroyed by boiling, and even by drying of the vegetables, and is of great importance in the prevention of scurvy. Not considering the water and salts for the moment, although it has been shown experimentally that life in the lower carnivorous animals may be maintained by the employment of the protein (nitrogen-bearing) foods alone, it is improbable that a healthful life may be long supported in man by this single class of food-stuffs. This is so because of the great demands required in digestion and assimilation and by the great increase of work thrown upon the excretory organs in order to eliminate the waste products. On the other hand, both experimental and clinical observations have shown that normal animal life is incapable of maintenance without proteins. Either fats or carbohydrates in combination with proteins are capable of preserving the nutritional equilibrium of the body, fats being weight for weight more efficient than the carbohydrates, but losing somewhat in their efficiency because of their greater difficulty of digestion. The true dietetic régime should, therefore, include a combination of all three of these classes of material. The proportion of such combination may vary within considerable limits; a fair proportion is that of Voit, who places the ratio of nitrogenous to non-nitrogenous foods as about 1 : 5, the carbohydrates largely in excess of the fats (10 : 1). Following Voit's estimation of the requirements of an adult man under normal conditions of life (proteins, 118 grams; fats, 56 grams; carbohydrates,



500 grams), one may roughly estimate such requirements for a period of twenty-four hours as about a pound of ordinary fat beef and two ordinary one-pound loaves of wheaten bread for an adult male. Commonly the safest guide for the determination of the amount supplied is the natural sense of hunger, careful estimates of the different varieties of food entering merely as a matter of interest, and occasionally of importance in the dietetics of the sick.

From the foregoing it follows that deprivation, absolute or relative, may be an efficient cause of deleterious results both in the total amount of food and in the elementary character of the same, and that the cause of justice may be concerned not only in cases where deprivation is total, but where it is systematically partial or the quality restricted. It is impossible in the space of the present article to discuss the nutritive value of the various food-stuffs, and where questions arise in such relations reference should be made to systematic works upon dietetics and physiology.

It is impossible to state the length of time in which starvation may produce death, since many modifying circumstances may occur in each instance. Death has been known to occur after but a few days' total deprivation, while there is reason to believe that total deprivation of ordinary food may sometimes, if water be allowed, be endured for several weeks, a month, or even more. The case of Dr. Tanner, who fasted publicly for forty days, drinking water as required, may be cited in support of such statement, although the credibility of the genuineness of total deprivation is, it cannot be denied, frequently questioned. Well-authenticated cases of deprivation of all foods, water included, are recorded, in which recovery followed after starvation for nine to twelve days. The allowance of water to animals experimentally starved may prolong life to double the duration possible without it; and in the experience of starving human beings a similar protracting influence has been noted. When deprivation is incomplete in other substances besides water, the duration of life is very indefinite, and cannot be estimated without consideration of the actual degree of deprivation and the personal peculiarities of the case.

The period of life best suited for resisting starvation is that of full development—*i. e.*, early manhood or womanhood. Starvation of infants is apt to terminate fatally as early as the second or the third day of deprivation; and the aged are likewise likely to succumb in the course of several days. The state of nutrition at the beginning of the fast is of material influence upon its possible duration, the fat stored up in the body being drawn upon as food for its maintenance. Females, therefore, on account of their relatively greater adipose deposit, are liable to withstand starvation for a longer period than males. The loss of energy through physical exertion, as seen in the endeavors of starving persons to reach places of relief, materially diminishes the time when a fatal termination may be expected. Low degrees of surrounding temperature also accelerate the oncome of death; high surrounding temperatures, on the contrary, are not protective, but also accelerate,



unless a sufficient amount of water is available. Moderate warmth, however, favors the continuance of life, and the possession of sufficient clothing has more than once been the means of saving human life in periods of temporary deprivation. Chossat first called attention to the fact that in experiments upon animals, when the temperature has fallen as low as 76.8° F., death usually occurs, a temperature commonly lethal in cases of refrigeration, and it has been inferred that the loss of body temperature in privation bears some causal relation to the death. Diseases which have impaired the nutrition of the patient, pathologic conditions interfering with alimentation, chronic wasting diseases—all exert an unfavorable influence upon the powers to resist the effects of starvation, and are frequently the actual causes of the starvation. Various chronic drug habits—alcoholism, morphinism, cocainism, etc.—by their interference with the alimentary functions, lead to greater or less impairment of nutrition, and may, therefore, be considered as predisposing states to the final effects of incidental starvation. It is not unusual, in the rare instances in which privation is employed purposely to destroy life, that other forms of ill treatment should also have been practised upon the victim. Violence, exposure to extremes of temperature or inclemencies of the weather, permission of filth accumulation with all its attendant miseries, harsh moral influences—all may have combined to render the waning life of the sufferer more horrible, and neglect of attention to intercurrent or consequent ills may materially hasten the close of the case.

**Symptoms.**—The sense of hunger, after manifesting itself a few hours after partaking of food, becomes more and more urgent for forty-eight or seventy-two hours and then gradually lessens in intensity, the desire for food being almost entirely lost in many cases of well-advanced acute starvation. An uncomfortable sensation in the epigastrium is usually felt. The intellect often remains unclouded throughout the duration of the case until just before death, when coma usually ensues; in other cases, after a day or two of great restlessness, the patient becomes calm, quiet, even lethargic, until near the end, when restlessness may again supervene before the coma develops. Emaciation is the most prominent objective symptom, the greatest loss of weight taking place during the early part of the period of privation. Eventually it is apt to become extreme; the muscles and fat waste away until the skin hangs loosely, and the bones stand out prominently as if covered only by the skin. The greatest loss of weight occurs by loss of water, by the absorption of the fat from every situation of its deposit, and by great diminution of the musculature; but some diminution may be met also in nearly every soft part of the body. The eyes are sunken from loss of the orbital fat, and the face is ghastly and thin. The skin becomes dry, harsh, and often bronzed. The tongue is thickly furred, and the mouth and throat are dry. One or two defecations at the beginning of the case are normal, but then become small and infrequent until just before death, when a colliquative diarrhea may set in. The urine rapidly becomes scant and of high color, often containing

a small amount of albumin. The respirations rapidly become more and more shallow, weak, and frequent. The pulse becomes small, weak, and either very rapid or very slow. The loss of physical strength is greatest in the first few days, but is gradually progressive throughout the case, and becomes extreme with the terminal diarrhea. A peculiar, disagreeable, mouse-like odor arises from the patient and pervades the apartment. The pupils are usually moderately dilated, and the conjunctivæ are blood-shot. The patient complains of great dizziness, and trembles upon the slightest exertion. Sometimes, in advanced cases, just before death, hallucinations and dreams of feasting, sometimes actual insanity with well-marked delusions, may come on. Death from a gradual failure of the heart finally occurs while the patient is unconscious; occasionally slight spasms terminate the case. This acute form of starvation begins suddenly, from accidental privation, as in the entombment of miners, the wreck of a vessel, the occurrence of a delusion demanding abstinence from food in the insane, or deliberate withdrawal of food by those in charge of some unfortunate individual.

The chronic form occurs in famine from various causes—in those possessing some grave lesion of the nutritive apparatus, as a cancer of the esophagus or stomach; in children in charge of ignorantly or perversely careless nurses; or in the helpless insane under similarly inefficient caretakers. Here the course of the case is usually much more protracted, months frequently intervening from the first privation to death; but the symptoms are similar to those of the acute form. These are: Loss of strength and weight, which are marked and progressive, with emaciation, cadaveric countenance, pallor, thinning and darkening of the skin, feebleness of respiration and circulation, dry, furred tongue, constipation, diminished acid urine, restlessness, peevishness, tremor, and dizziness. The intellect, as in acute starvation, may remain for the most part clear until near the lethal stage, when stupor, delirium, or coma generally appear. Hallucinations, phantasms, and actual insanity may develop. Often in these protracted cases the blood is seriously altered and purpuric eruptions appear, lending, at least toward the close of the case, a superficial similarity to scurvy. In both acute and chronic starvation the temperature tends to fall. Large diurnal variations between morning and evening records are common. As low a registration as 75° or 70° F. may be reached before death. The rapidity of loss in strength and of emaciation, as well as of the development of the other symptoms, is dependent upon the relative degree of privation, but the extreme manifestations to be met in either form are the same. This loss of weight is less marked in infants or in those weak from disease or age, who succumb before the emaciation becomes extreme; but, as a rule, as much as 30 or 40 per cent. of the body weight is lost before death. Death generally occurs from asthenia or syncope, or, as in the acute form, spasms may end the miserable scene.

**Postmortem Appearances.**—Postmortem decomposition often sets in rapidly. The body usually presents a squalid appearance, and the peculiar odor previously mentioned persists. The skin is thin, often

ulcerated or excoriated. It has a dirty brownish appearance. This tint is widely distributed, but varies in hue in different parts, and is apparently the result of the persistence of the dead, dry epithelium. Bed-sores are frequent. The emaciation is extreme; and in many cases every evidence of neglect, from marks of brutal violence to the infestation by vermin, may be at hand. The eyes are sunken, dry, and generally injected. The mucous membranes are pale, and the tongue is dry and coated.

The body being opened, the absence of the ordinary fat deposit beneath the skin, in the omentum, and in the other usual situations is most striking. The muscles are small and pale; the stomach and intestines are contracted, the contraction being generally more marked in some portions than in others. These viscera are usually empty. The mucous membrane of the stomach and upper part of the bowel is diffusely stained with bile. The walls of these viscera are thin, the wasting making them almost transparent in extreme cases. Should the bowels retain any of their contents, such are generally found in the lower bowel as hard, scybalous masses. Often the lower portion of the large bowel will present more or less evidence of inflammation. There are no important changes in the kidneys, liver, spleen, or pancreas, save possibly a moderate diminution in size and increased depth of color from congestion. The gall-bladder is apt to be distended with dark, fluid bile. The heart is commonly somewhat diminished in size, and its epicardial surface is pale and loose. The diminution in weight of this organ is not, however, in the writers' experience, proportionate to the wasting in the remainder of the muscular system. There is but little blood in the heart, and that in the right side is dark and fluid. The heart muscle is pale and flabby. The lungs are usually pale, somewhat edematous, and present hypostatic areas of congestion at the base. The meningeal venous vessels are frequently full of blood; there is often some excess of serous effusion in the meninges and ventricles; the brain substance is generally pale and soft.

In the examination of the body of a person suspected of having died from starvation the following questions should be inquired into in order that the evidence before the court may be fair and sufficient for the questions possibly arising: (1) Are the usual appearances of death from starvation present in the body examined? (2) Are there evidences of the existence of other disease present? (3) If the latter is the case, could such disease have given rise to the appearances of starvation or to the starvation itself? (4) Could such disease have materially influenced the course of ordinary starvation? (5) Are there reasons to believe that the deprivation of food could have caused the lesions of such other discovered disease, or could it have seriously complicated the course of such affection? (6) What relation do the antemortem symptoms, as known or elicited by legal inquiry, bear to the probability of death by starvation or by other discovered disease? Such questions necessitate not merely the recognition of the postmortem signs already indicated, but likewise require of the physician in his autopsy to seek



carefully for the existence of any disease that might explain the signs of inanition upon a natural ground, and for existence of complications which may have influenced the course of the case. The whole alimentary tract and its associated viscera should be examined for the existence of malignant tumors, strictures, serious inflammations, compressions, or atrophies. The possible existence and influence of wasting diseases, such as tuberculosis, diabetes, Addison's disease, or the severe anemias, must be considered, and careful attention given to the possible relations of the entire symptom-complex with such diseases. In addition to these points the usual care in noting the ordinary medico-legal features in and about the dead body must, of course, be followed.

**Treatment.**—The main indication in the efforts toward restoration of those dying from starvation is the administration of nutritious material. Caution should be observed, however, in every such administration, since the least excess is likely to be followed by serious reaction, even death. Only small amounts of food should be given at a time to such a patient, the administration repeated at frequent intervals, and great care observed to provide only the simplest and most easily digested substances. Milk is very valuable for such purposes, and the concentrated and partly digested food preparations are likewise of great efficiency. For a time all food should be fluid, and be administered hot. The addition of solid foods should be made gradually and with care, the readiness of digestion and nutritive value being considered. Failure to attend to such cautions may be followed rapidly by death, probably from vasomotor disturbances reflexly aroused by the presence of the large mass in the stomach. Stimulants may be administered with benefit, care being taken that they should be given in small amounts and in dilute form if administered by the mouth. When possible, they are best given hypodermically. All substances given by the natural tract should be warm, so as to aid in digestion and diffusion and at the same time contribute heat for the readjustment of the depressed body temperature. So, also, the application of external heat and rubbing the surface with warming lotions to cause the return of the superficial circulation should be employed.

**Legal Considerations.**—From the standpoint of the physician little need be added to the cautions already indicated in the performance of the autopsy. It should be recalled, however, that in determination of death from starvation the sole judicial question does not concern the absolute withdrawal of food from the victim, but that there is reason for legal inquiry also where the partial privation of quantity or quality has caused or has been contributory to death. And so, also, the matter of motive, in long-continued, systematic partial starvation, as may be practised upon weaklings to their eventual death, is as much a question for judicial consideration as the wilful and total deprivation of food. In the establishment of such motive and its legal bearing, questions of interest, ignorance, and superstition are to be fairly considered, in which inquiries the evidence as to coincident ill treatment of the victim in other matters than in the provision of food should be duly weighed.

## THIRST

The deprivation of water is, in reality, like the deprivation of other foods, a form of starvation. The deprivation of water is almost invariably accidental and surrounded by such circumstances as to obviate the necessity for careful legal investigation. Heat of the surrounding atmosphere, character of the climate, and the physical energy used in the efforts to reach water all contribute largely to the rapidity of development and intensity of results of deprivation of fluid. The desire for water quickly becomes overpowering, the saliva disappears, the throat and the tongue become dry and swollen, and the sensation of taste disappears; swallowing of other food becomes impossible. The skin is dry and hot, later becoming pale and shriveled. Muscular power diminishes rapidly; vertigo and dimness of vision, feebleness of voice, diminution of urine, restlessness, insomnia, hallucinations, and insanity may all develop. Death takes place usually in four or five days, at the utmost, in able-bodied males; a much shorter period being required in less vigorous individuals. After death the body is wasted, the surface pale, shriveled, and dry, the eyes are sunken, and the mucous membranes are pale and cracked; the blood is firmly clotted, the viscera are congested but not swollen, and the musculature and fat are much wasted.

In the restoration of those dying from thirst the irritability of the gastric mucous membrane and the vascular inertia to sudden shock must be kept in mind; and liquids should be given only in small amounts and preferably heated. The symptom of thirst should not be heeded in such cases, as it is of central origin and is not appeased until the entire system has received the benefits of restoration of fluid; and it is well known that if left to themselves, men dying of thirst are likely to die after overloading their stomachs with water, which is promptly vomited, and the patient is but rendered the weaker for the efforts at retching. Hot coffee in small quantities at a time and dilute affords the best measure for immediate use, the stimulant action of the coffee increasing the flagging circulation and causing more rapid absorption and diffusion of the liquid. Enemas of warm saline solution, much as in the well-known "Murphy drip," if possible under conditions of environment, or small parenteral introductions of normal saline, must in such cases be of high value.

# DEATH AND INJURIES BY LIGHTNING AND ELECTRICITY

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**Historic Introduction.**—From the classics that deal with the history of medicine it can clearly be gathered that from the very earliest times man had a knowledge of the deadly effects of lightning, and we read of various methods and devices that were brought into use by numerous savage tribes to protect themselves from its dangers, and also from the accompanying thunder, though it is not evident that the relationship between the two phenomena was known; indeed, most tribes seemed to fear the thunder more than the lightning. Among these primitive cultures most of these wish-fulfilling agencies consisted of various incantations with occasional complex ceremonials which were chiefly directed toward appeasing the deities who were supposed to have been outraged. Grecian mythology affords numerous illustrations of the worship accorded to this power, and even in the middle ages it is related that the custom of the ringing of bells originated as an effort for protection, it being believed that this ceremonial observance was capable of neutralizing the bad effects of the lightning. The early philosophers, Aristotle, Lucretius, Seneca, Pliny, and others, record not only the deadly effects of the lightning-stroke but also the melting of buttons and coins of brass, copper, and the precious metals, and they even report the melting of such coins in the purse with no evil effects to the wearer. Many similar occurrences are observed at the present time and the evidences may be found in many modern museums.<sup>1</sup>

The early Italian physicists developed the knowledge of frictional electricity, and Franklin, in 1752, actually demonstrated, by means of his renowned kite, the relationship between frictional electricity and lightning. Richmann of Petrograd, repeating some of these experiments in 1763, was killed in his own laboratory from a lightning-rod lightning stroke. He first showed what part the clouds played in the phenomena and the true cause of the thunder, though it is known that Aristotle had made some shrewd observations on the relationship between thunder and lightning. Since the time of Franklin's work the theoretic researches concerning the principles of electricity and the practical applications of this fluid have been enormous, and at the present time the uses to which electricity in its various forms is put are unimag-

<sup>1</sup> See Jellinek, *Atlas der Elektropathologie*, 1909, where photographs of this nature are to be seen.



inable. With the rapid extension of the economic applications of this force there has necessarily entered an increased amount of risk to health and even to life, and daily the loss of life brought about by contact with different forms of industrial electricity is increasing in an astounding manner.

**Incidence.**—In 1891, 205 deaths by lightning were reported in the U. S., and 292 in 1892; and in the five years, 1890 to 1895, lightning is credited with the killing of 1125 persons in this country. Boudin collected reports of 2238 people killed in France during the twenty-eight years from 1835 to 1863. In this same country, from 1854 to 1864, there were 967 deaths from this same cause. In Prussia 819 deaths from lightning were reported between 1869 and 1878.

The United States Mortality Statistics of the Registration Areas indicates that in these states the average number of deaths by lightning in the years 1901 to 1905 were 98, or 0.3 per 100,000 of the population; in the period of 1906 to 1910 there were 154; in 1913, 317; 1914, 287; 1915, 231, and in 1916, 340. The general average being between 0.3 to 0.5 per 100,000 during these fifteen years. The Registrar General of England and Wales, during the ten years of 1901 to 1910, recorded 124 fatal accidents from lightning.

Many more people are struck than are killed. The interesting observation of Jack is classical. In this instance 300 people were in a church which was struck by lightning: of these, 100 were injured, mostly made unconscious, so had to be taken to bed, and 6 were killed. As many as 11 and 18 persons have been killed at one stroke. Vincent mentions the effects of a bolt falling in a flock of 1200 sheep, of which 556 were killed.

Boudin, whose statistics are widely quoted, had collected reports previous to 1891 of but 39 fatal cases; these figures represent but a small proportion of the actual number of deaths, since they are limited to France, where the use of industrial electricity had not found so extended an application. H. P. Brown collected some 110 cases of death resulting from contact with electric lighting plants alone, all of which occurred in 1888 and 1889. Biraud, in 1892, made a calculation that there had occurred in France 300 deaths and 1000 accidents of a lesser degree. Since that time, however, the use of high potential electric machinery has increased, and such forms of apparatus are now to be found in almost every town in the country. Electric lights, railways, different forms of power transmission in factories, mines, and stores are now universal, and the future industrial applications that may be made are boundless.

The statistics of the United States Census reports for the years 1913 to 1916 shows the following for the registration area, which, as is well known, constitutes about 70 per cent. of the population of the United States. It takes in 26 states, the District of Columbia, and 35 cities. It includes the chief centers for population and the areas in which the maximum use is made of electrical currents, excepting perhaps certain industries, mining in particular.

During 1913 there were 670 deaths from electricity reported in this registration area, or 1.1 per 100,000 of the population; in 1914 the deaths fell to 553; in 1915 to 515, in 1916 there were 586 deaths, or 0.8 per 100,000 of the population.

The English Registrar General's returns for England and Wales in the period from 1901 to 1910 showed, for a population of 32,000,000 to 36,000,000, 183 deaths in this period.

As a rule industrial accidents are confined to men, and usually accidents occur singly, but in 1909 in Lombardy 10 people were killed at one time from a 3000-volt three-phase current, and several others seriously injured.<sup>1</sup>

The principles involved in accidents due to lightning are fairly well established, but with reference to injuries due to the various form of industrial electricity there are many theoretic points in dispute, and with the development of a great variety of different types of current a great chapter is open for investigation.<sup>2</sup>

With reference to the action of lightning, experimental research has shown that similar effects can be produced by the use of frictional machines and Leyden jars, and Richardson<sup>3</sup> conducted a number of experiments on animals with this form of apparatus. Nothnagel, in 1880, also made a number of observations, and further pathologic study in cases of death due to lightning has resulted in giving a fairly clear picture of the effects produced on the animal body by this agency. In lightning itself the electromotive force is so high that it cannot be measured.

During the World War many accidents occurred from contact with defense and prison wires charged with high-tension currents. Fürth<sup>4</sup> has contributed a study of these. In the matter of commercial electric application there are a number of questions of medicolegal interest closely related to the technicalities of potential, resistance, and amperage of electric currents which are of interest in the general discussion.

**Resistance of the Body.**—One of the most important safeguards against the passage of electric currents through the human body is its high degree of resistance. This is largely proportionate to the fluid constituents. This is very frequently stated to be from 1000 to 3000 ohms, but there are so many circumstances which modify this that didactic statements should not be made without taking these into consideration. Thus, when the epidermis is perfectly dry, its resistance to the passage of electric currents has been shown by Jolly to be very high, measuring, in Siemen's units, from 8000 to 40,000 ohms (Herold). Dry skins are more resistant, also hard and oily skins. Moist, soft and perspiring skins have much reduced resistance. If the skin is thoroughly moistened, the resistance of the body may register but 500 ohms, and skins treated with alkalis that remove the fat are

<sup>1</sup> Jex-Blake, Brit. Med. Jour., March 1, 1913

<sup>2</sup> Consult Jellinek's numerous papers, his atlas, and large text for the literature to 1909.

<sup>3</sup> Medical Times, 1869.

<sup>4</sup> Fürth, München. med. Wchnschr., 64, 1917, 926.

less resistant. Herold quotes Bullard's computations on 259 males, where the resistance from one hand to the other varied from 550 to 1970 ohms, and in a series of measurements of 236 men, also quoted by Herold, the average resistance was 1184 ohms, the extremes ranging from 610 to 1870 ohms. In addition to this external moisture there may be a number of important factors, pertaining to the internal composition of the tissues through which the currents may pass, which are but little understood. Thus it is reported that in Basedow's disease the electric resistance is greatly diminished; the same is said to be true of hysteria. Muscle tissue compared with nerve, bone, and skin according to Larrat<sup>1</sup> stand in the proportion of 1, 2, 5, 15 and 100 to 500 respectively. The transverse resistance in the human body is much greater than the longitudinal. Beard and Rockwell have made the curious and interesting computation that an inch of the sciatic nerve has eight times the resistance of the Atlantic cable.

Voltage, or the tension current, bears an important relation to accident and injury. As this factor is modified so greatly by the **character** of the current, whether continuous or alternating, and by the **quantity**, or ampérage, it is difficult to determine just what relation voltage bears to these in the causation of disastrous results. Moreover, as pointed out by Tatum and Cunningham, individual variations in the character of the heart muscle are to be considered; thus, there seems to be ample ground for concluding that, in addition to the influence exerted by the quality, duration, strength, and density of the current, other factors residing in the heart, of a probable physiologic nature, exercise considerable influence in the production of fatal effects. The direction in which the current is passed, to be discussed more fully, is also an important item. Thus Tatum<sup>2</sup> has shown that it requires much stronger alternating or continuous currents to produce death when such currents are passed from the head to the lower cervical region of the back than when such currents are sent through the head to the thorax or through the thorax. In fact, it is in the determination of just these relationships that more discussion is relevant.

In general, the amount and the duration of contact of the current are the essential features of danger from electrical currents. High voltage, long duration, and close contact usually cause severe systemic shock, burns, coma, or death. Moderate intensity with medium duration and imperfect contact produce burns of the second degree or less, momentary unconsciousness, slighter grades of shock, with paresthesia. If the currents are of low intensity, the duration and closeness of the contact less, only first degree burns are produced, there is rarely disturbance of consciousness and the tingling paresthesiæ are milder or even quite fugitive. Very short periods of imperfect contact with low intensities are apt to cause paresthesiæ only.

E. Grange was one of the first to describe a case of death due to industrial electricity, and later he, Brouardel, and Gariel instituted a

<sup>1</sup> See Moorhead, Journal American Medical Association, April 2, 1910, p. 1127.

<sup>2</sup> New York Medical Journal, 1890, p. 287; Electrical World, 1890, p. 319.



series of experiments to determine what were the important factors in death by electricity. A more extended series of researches was then instituted by d'Arsonval and Brown-Séquard<sup>1</sup> with both constant and alternating currents. They confined their attention mainly to the question of the cause of death (see later), but on the subject of the relationship of voltage and character of current they observed that the current derived from a primary coil is more dangerous to life than that obtained from the secondary coil, especially when this was provided with a condenser. With the Gram alternating machine, then in use, they were able to kill guinea-pigs with a current of 120 volts, but with a battery giving a current of 420 volts death could not be produced unless the current was interrupted very rapidly and its application continued for a considerable time. In their opinion death was produced in this case by tetanic rigidity producing asphyxiation rather than by the direct action of the current on the heart or the nervous system. They, moreover, concluded that the Gram continuous current machine is rendered dangerous only by the introduction of a secondary coil with a rapid interrupter. The extensive investigations of numerous investigators<sup>2</sup> have demonstrated that, for lower animals at least, continuous currents of high voltage do less harm than alternating currents of the same or even greatly reduced voltage. Thus, in his report on the physiologic action of the effects of various kinds of electric currents, Dr. F. Peterson says: "It can very readily be demonstrated that alternating currents are more powerful and severe than a continuous current on its mere interruption. As a current will stimulate a nerve in something like  $\frac{1}{1000}$  second, it is clear that when the continuous current is closed on a body for a limited space of time there is but one shock at the closing and one at the opening of the circuit; whereas with an alternating for the same interval of time the shocks are twice as long and as many in number as there are reversals of the current per second. If the stimuli are too numerous, say over 65 per second, a condition of tetanus is produced in the muscles supplied by the nerves stimulated. The same fact holds good as to currents of any strength.

"From this it must appear plain that if a continuous current, say of 1600 volts electromotive force, is sufficient to cause death, then an alternating current of much less than half that voltage must be fatal under the same conditions." In his series of experiments dogs were not injured by continuous currents of 1400 volts, but alternating currents of 300 volts caused great distress in two seconds. With 4000 vibrations a minute, and in the strength of 570 volts the dogs were killed at the expiration of three seconds. With the same voltage and an increasing number of interruptions the fatal quality of the electricity is manifest. Thus their dog 7 was killed in five seconds with 250 volts with 288 alternations a second, and dog 8 was killed by 160 volts with the same number of alternations a second.

<sup>1</sup> Comptes rendus de l'Academie des Sciences, April 4, 1887, vol. civ, p. 978.

<sup>2</sup> The Comparative Danger to Life of the Alternating and Continuous Currents H. P. Brown, New York.

In January, 1889 the present electrocution laws of New York State went into effect. Previous to this time further experiments were conducted on animals of greater weight than dogs in order to approximate the conditions presumably present for man and thus gain some experimental standards by which the electrocution methods could be carried on successfully. In the physiologic experiments made preparatory to the use of the present electrocution methods it seemed fairly well established that no human being could withstand the alternating current of 1500 volts, and 300 had produced death, while for the continuous current it was necessary that over 3000 volts were requisite to bring about fatal results.<sup>1</sup> In practice, 1700 volts, alternating, is the average electrocution amount used.

**Grades of Accident and Injury.**—The average electric pressure in electric lighting varies from 100 to 225 volts (direct); in overhead and



FIG. 134.—Burn of electric current of 1800 volts and 14,000 volt-amperes, showing two blisters, one broken, at the site of the entrance of the current (Kratzer).

underground trolley systems from 500 to 600 (direct); suburban lighting circuits, 1000 to 2000 volts, alternating; series arc lighting circuits, 2000 to 4000 (direct or alternating); in overhead long haul railway systems, as the N. Y. N. H. R. R. Co., 11,000 volts, alternating. The third rail railway systems, about 500 volts, direct. Some very high voltages are transmitted by wire: thus in Grand Rapids, Mich., 100,000 volts; in Denver, 88,000 volts; Los Angeles, 75,000, and Niagara Falls, 60,000.

The voltage of the lightning stroke has not been measured. Lodge has calculated it to be as high as many million volts for a spark a mile long. This same physicist has calculated 70 coulombs for some flashes. The amperage has been measured in some cases as high as 11,000 to 20,000 amperes. The time element is very small for lightning flashes, approx-

<sup>1</sup> Cunningham on Amperage (see Cunningham), New York Medical Journal, 1890, p. 287.

imately  $\frac{1}{100,000}$  second (Lodge, Sylvanus Thompson). The energy released has been calculated or estimated as 2000 foot-tons or 101,000 joules.

It is not purposed to discuss in this section every variety or grade of morbid process induced by the shock of lightning or industrial electricity, for it is apparent, from reference to an immense literature, that such are very varied in their manifestations, ranging from the slightest nervous shock to death. When the injury comes about by other means than by the direct current, as when a lineman falls from the pole by reason of the loss of muscular control induced by touching a "live wire," a series of injuries may result having nothing to do with the question.

This latter class may be dismissed from the present discussion, as the injuries are due to the fall rather than to the electricity, though in some fatal cases it may be difficult justly to place the responsibility. A

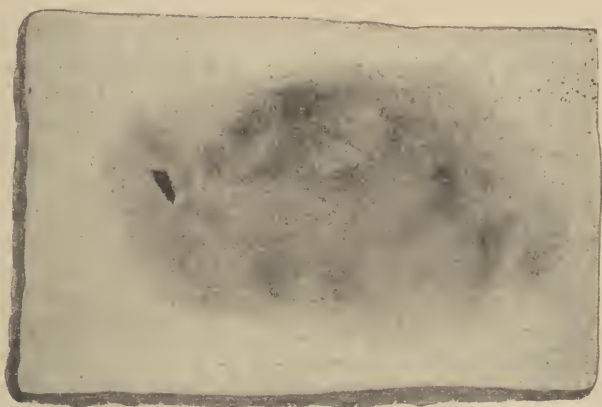


FIG. 135.—Skin of back of same case (Fig. 134), showing burn at point of contact-exit of current with extensive blood extravasation (Kratter).

great variety of injuries occur in this way—fractures, dislocations, sprains, bruises, and open wounds. All these accidents have an important medicolegal bearing, as the initial cause is the electric shock.

While the direct action of lightning and industrial electric currents may produce much the same character of results, it is convenient to consider the symptoms of each separately.

**Minor Injuries from Lightning.**—These may consist of simple mental shock or intense and prolonged nervousness, a symptom which is by no means infrequent with many people. If an electric bolt strikes in the near vicinity, a mild stunning may be experienced, with a sense of suffocation, which will in all probability pass off quickly, or in some sensitive and neurotic persons an attack of nervous crying may be brought on. In such patients suppression of menstruation has been produced, and cases of abortion have been reported. In the severer cases loss of consciousness, which may be transitory or much prolonged,



is not rare, and this is frequently followed by various phenomena, ranging from numbness and prickling of various areas of the body (paresthesiae) to anesthesia or analgesia of the extremities or side of the face, with difficulty in mastication. Paralyses are by no means uncommon, occurring in the muscles of the arms and legs; ptosis and strabismus have been reported; deafness and loss of smell and taste, with paralysis of the bladder and rectum, and motor inco-ordination may be present. Polyneuritis has resulted.<sup>1</sup>

In Nothnagel's cited experimental work the development of peripheral paralyses, both motor and sensory, was a prominent feature; and among many other reports of similar phenomena those of G. de Savigny<sup>2</sup> and Charcot's<sup>3</sup> are among the most striking. They describe cases of peripheral paralyses of a marked neurotic character. Traumatic neuroses of a most refractory kind are reported by a large number of observers, notably Freund,<sup>4</sup> Frankl-Hochwart,<sup>5</sup> and Kratter. In children, Demme<sup>6</sup> has described a type of spinal paralysis following lightning-stroke.

Not only do psychogenic neuroses follow the lightning-stroke, but there are cases on record in which actual anatomic lesions have supervened. The literature of the subject is so extensive that only a few of the more carefully observed cases can here be cited. Death has been observed with no demonstrable cellular alterations (Sestier *et al.*). Thus Leber<sup>7</sup> and Pagenstecher<sup>8</sup> both describe the production of changes in the optic nerve, with temporary or permanent blindness, and Laker<sup>9</sup> describes in great detail the occurrence of blindness following a lightning-stroke, which blindness was produced by extensive hemorrhages into the retina.<sup>10</sup> Von Limbeck<sup>11</sup> reports a case of right-sided paresis, with contractures and increased reflexes, following lightning-stroke, in which there were hemorrhages in the brain; thus, in a sense, corroborating the evidence derived from experimental researches on animals.

Psychoses, usually of the maniacal type, have been known to occur closely following lightning-stroke. Thus Taylor<sup>12</sup> cites an instance of a

<sup>1</sup> Sterling, Neurol., Centralbl., 37, 1918, 577.

<sup>2</sup> G. de Savigny, Revue méd. française et étrangère, 1881.

<sup>3</sup> Charcot, Leçon du mardi, à la Salpêtrière, 1889.

<sup>4</sup> Freund, Ueber einer Schreckneurose nach Blitzschlag, Deutsche medicinische Wochenschrift, 1891.

<sup>5</sup> V. Frankl-Hochwart, Ueber Keraunoneurose, Zeitschrift für klinische Medizin, Bd. xix, Th. 5, 6.

<sup>6</sup> Demme, Virchow's Jahresbericht, 1883, S. 626.

<sup>7</sup> Leber, v. Graefe's Archiv, Bd. xxviii.

<sup>8</sup> Pagenstecher, Archiv für Ohrenheilkunde, Bd. xiii.

<sup>9</sup> Laker, Ein Fall von Augenaffectio durch Blitzschlag, Archiv für Augenheilkunde, 1884, S. 161.

<sup>10</sup> Also see later literature in Jellinek, loc. cit., Stieda, Münch. med. Woch., 1906. Gonin, Ann. d'Oculistique, 1904. Wendler, Deut. mil. ärzt. Ztsch., 1908. Ama-viellhe, Arch. de med. et ph. mil., 1908. Pfahl, Deut. med. Woch., 1908. Nagelschmidt, Deut. med. Woch., 1908. Palmer, Journal American Medical Association, 1907. Watt, Glasgow Medical Journal, 1906. Darling, British Medical Journal, 1908. Mills and Weisenburg, University of Pennsylvania Medical Journal, 1903. Jex-Blake, British Medical Journal, March 1, 1913.

<sup>11</sup> Von Limbeck, Prager medicinische Wochenschrift, 1891, Bd. xvi, No. 13.

<sup>12</sup> Taylor, Medical Jurisprudence.

patient who became delirious for three days, and on recovery was found to have lost his memory completely. Jellinek<sup>1</sup> reports a case of a woman who developed an acute delirious excitement with aphonia which persisted fifteen days.

From a medicolegal point of view the traumatic neuroses afford an extensive field for careful and extended research. Among the many cases of malingerers or quasimalingerers there are, nevertheless, a considerable number of people who suffer acutely and deeply from the effects of an electric shock. The space at hand does not warrant the complete discussion of such cases; suffice it to say that there are perhaps but few questions of recent years that excite more interest than do those related to the traumatic neuroses.

A variety of attending phenomena are recorded—flashing in the eyes, buzzing in the ears, general tremor, going on to rhythmic convulsions, with or without loss of consciousness. Persons seen while in this stage of muscular contraction have been described as cyanotic, with dilated pupils. The respiration is likely to be stertorous, or, if the tetanus is sufficiently severe, there are but few respiratory movements. The pulse is generally feeble, sometimes full and soft, and sometimes it seems as though the heart were beating very rapidly and irregularly. Under experimental control, in animals, there are certain discrepancies in the accounts given by various observers, but it would seem probable that the heart bears the chief burden of the electric action, and hence reliable clinical observations in cases of accident are wanted.<sup>2</sup>

**Pathology.**—A great variety of external lesions resulting from lightning and industrial electricity have been described. In some fatalities due to these agents no discoverable traces have been elicited. In many there have been found minute bluish punctiform spots, or very fine reddish spots on the hands and feet, produced by the out-flowing electric currents, and in still others numerous fine ecchymotic extravasations may be irregularly distributed over a large area of the body.

In by far the greater number of cases burns of various degrees are present.<sup>3</sup> These may vary from simple vesication to charring of the flesh, even to the bone. Many are produced by the burning of the clothes, but others are due to the action of the lightning itself. Fractures of bones are quite common, and cases of amputation of the members are on record.

Following death from lightning, Kratter and others have described cases in which the effect of the electric transmission was evidenced only by a disruptive lesion of the hands. Here it would appear that the electric bolt had streamed out of the finger and torn its way through the skin in its passage. [See Fig. 134.]

It is of considerable medicolegal importance to note that in a number

<sup>1</sup> Jellinek, *Elektropathologie*, numerous contributions in *Wiener klin. Woch.* and other German periodicals from 1903 to present, 1922. Also Kettelhoit, *Kiel Dissertation*, 1918.

<sup>2</sup> Julliard, *Ch.*, *Revue Suisse des Accidents du Travail*, 1910, 4.

<sup>3</sup> Moorhead, J. J., *Journal American Medical Association*, 1910, 54, 1127.

of cases there have been reports of similar disruptive lesions, which have closely resembled wounds produced by a blunt dagger.

Among the minor lesions, charring of the hair should be borne in mind. Most of the burning lesions are associated with the electric lighting and railway systems. With the work of linemen working on overhead wires, lesions due to falling should be considered when there may be doubt in the diagnosis of the cause of the injury. In such cases the burns are, for the most part, situated on the hands, though they may at times show very bizarre distributions. The results of the falling are multifarious, and should be considered as purely surgical accidents.

Distinct surface markings may be manifest in persons who have sought protection from lightning under trees. The lightning, in its



FIG. 136.—Lightning-marks (*International Text-Book of Surgery*).

descent, is thought to follow the line of least resistance, which usually coincides with the path of greatest moisture. This may be in the cambium layer, just beneath the bark, as claimed by Stricker,<sup>1</sup> or the bolt may follow down the moistened bark, then jump to the head, neck, or shoulder, usually producing a distinct burn. From there its course may be marked on the outside of the body as a fine, irregular, zig-zag line of extravasation, ending at times at the nates or traveling down to the legs. In some instances the markings on the arms or trunk are feathery (see Fig. 136). When the person is leaning against the tree or is standing free, differences may be noted in the character of the burn-

<sup>1</sup> W. Stricker, *Die Wirkung des Blitzes auf den menschlichen Körper*, Virchow's Archiv, 1861, Bd. xx, S. 45.



ing that may occur. Stricker, in his memorable study, claims the following features:

1. In those cases where the person may be leaning against the tree, side of a house, etc., the lightning usually enters the point of contact. This is, as a rule, the shoulder or the side of the neck, where a marked burning takes place, with extravasation of blood and injection of the blood-vessels, which are often prominently spread out as hand-like or leaf-like blotches. From the shoulder a delicate line may be traced to the back and down along the spinous processes to the nates, becoming smaller as it descends and more superficial. Here, by reason of the clothing, two things may occur: (a) The electric stream may be carried off by the clothing, which is destroyed or torn off from the lower limbs, or the charge may break through the clothing, carrying away a localized fragment more or less circular in general outline. (b) If the charge is carried by the skin, the more prominent parts, the trochanters of the long bones, are very apt to be severely burned. The streak goes down on one side or sometimes down both limbs, growing smaller, and produces burns on the knees. It may jump to the shoes, entirely destroying them, or go on out through the stocking or the bottom of the foot through the shoe, producing here many fine punctiform hemorrhages in the sole of the foot.

2. In persons not leaning directly against the tree or building the stream may jump to the head bones, producing at times instant death, or, if it passes by means of the skin, the streak noted is more apt to travel in the anterior part of the body to the inguinal region, producing severe burns about the genitals.

The electric current may also traverse the deeper portions of the body. The lesions then produced are extensive, and will be discussed under the head of internal findings. Burning of the hair is one of the most constant features in such accidents, occurring, according to Stricker and other observers, even when no other signs of injury are to be found, and hence it is to be considered as one of the most important signs of the conduction of the electric charge.

In some instances death has occurred so rapidly that the body has preserved the attitude in which it was struck and has shown absolutely no external evidences of the cause of death. Thus Taylor cites the cases of 5 negroes who were simultaneously prostrated by a single lightning-stroke. Three of them, 2 being children, were instantly killed. The only mark found on one, an adult female, was a burnt spot, the size of a dollar, under the right axilla, and this woman's clothes were set on fire.

As there have been great numbers of physiologic experiments made with commercial electric currents, the knowledge of the external lesions produced by them is more accurate and deductions drawn are more valuable. Grange,<sup>1</sup> in 1882, had the opportunity to observe 2 fatal cases in the Tuilleries, and was perhaps the first to give the autopsy

<sup>1</sup> Des accidents produits par l'électricité dans son emploi industriel, *Annales d'Hygiène publique et de Médecine légale*, 1885, 3, 13, p. 53.

findings in cases of death produced by commercial electric currents. Two years later, with Brouardel and Gariel,<sup>1</sup> he made further observations of an experimental nature, which have been the basis of our present experimental standards. The work of Brown-Séquard and d'Arsonval followed closely after, while Peterson, Brown, Knapp, Kennelly, and Doremus were among the earlier American experimenters. Kratter and Friedenger were among the few German investigators with electric machinery previous to 1891. The American workers were the most active.

The external lesions produced by these commercial currents, both when under experimental control or when brought about by unknowing contact, have been, for the most part, burns of various degrees. A large number of interesting internal findings are recorded, however, which will be further discussed.

**Internal Pathologic Lesions Due to Lightning.**—The observations of Rindfleisch<sup>2</sup> and Langerhans<sup>3</sup> are among the earlier well-recorded post mortem findings in death by lightning, and may well be quoted here. Twelve minutes after death rigor mortis was well developed. The head and neck were livid, purple, and suffused. The eyelids partly covered the eyes, the uncovered conjunctivæ showing marked hyperemia.

Observations of a positive character on the internal viscera have been very few. The early cases of Aragos' collection are interesting mainly because of the notes made relating to the melting of precious metals, and later cases are on record where the shoes have been torn off with great violence by the lightning bolt and yet no marked effects experienced by the individual.

Schneider was among the first to record the fact that bones may be broken and blood-vessels ruptured. The early autopsies of Rindfleisch and Langerhans showed the following: The internal organs were not involved. The brain was hyperemic, but microscopically not altered (as studied by contemporaneous methods). Tourdes records a case of rupture of the membrana tympani and also breaking of bones and of the skull. He first showed that no changes occurred in the spectrum analysis of the blood. The abdominal viscera may suffer gross rupture; they may be torn and hemorrhagic, but few changes of a minute character have thus far been described. Gross lesions of the brain and meninges have also been quite frequently observed, but no observations on the cytologic changes of the brain cortex or basal ganglia are available for comparison with changes induced during the experimental studies which have been made of recent years.

**Internal Lesions in Death Due to Industrial Electricity.**—Pathognomonic lesions, for the most part, have been absent in these cases. Numerous experiments have been made on animals to determine the

<sup>1</sup> Brouardel, Gariel et Grange, Sur un phénomène observé chez les animaux soumis à l'action des courants électriques intense, Comptes rendues de la Société de Biologie, Nov. 29, 1884.

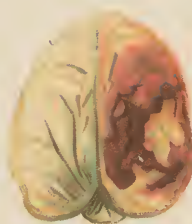
<sup>2</sup> Rindfleisch, Ein Fall von Blitzschlag, Virchow's Archiv, 1882, Bd. xxv, S. 471.

<sup>3</sup> Langerhans, Zwei Fälle von Tödtung durch Blitzschlag, Ibid., 1862, Bd. xxiv, S. 200.

PLATE 1.



*Fig 1*



*Fig 2.*



*Fig.3.*

FIG. 1.—Dura of guinea-pig killed by the electric current, showing marked subdural hemorrhage.

FIG. 2.—Brain of same animal, showing contusion, hemorrhage, and superficial burning of the meninges and convolutions of the right hemisphere. Extensive intermeningeal hemorrhage is also present.

FIG. 3.—Base of brain of same animal with extensive hemorrhage of the dura, especially in the middle fossæ. (KRATTER.)





causes of death and the character of the lesions. The discussion of the causes of death has been referred to another paragraph. The earliest experimental investigations made on animals with the modern industrial electric currents that are of service in the present presentation were those of Grange, Gariel, and Brouardel, made in 1884, and those of Brown-Séquard and d'Arsonval<sup>1</sup> in 1886 and 1887. It should be borne in mind, however, that Priestley, as early as 1766, killed animals by static electricity, and that at that time numerous experimenters followed him, notably Fontana, the Italian physicist. The observations of Nothnagel in 1880 are also worthy of record in this relationship.

D'Arsonval's results will be referred to under the paragraph on causes of death, since he was interested from the physiologic side of the problem only. From the pathologic point of view the investigations of Peterson and Doremus, conducted in the Edison Laboratories in 1888, are of importance. Postmortem findings in the animals already referred to in the opening paragraphs of this discussion showed the lungs to be normal in nearly all cases. The heart was engorged on the right side, and empty on the left; the abdominal viscera were normal, save for marked hyperemia. In some dogs slight extravasations in the muscles beneath the electrodes were observed. The nerve parenchyma of the sciatic nerve was normal, as was also the spinal cord (older methods of investigation were employed).

Animal experiments made by Kratter<sup>2</sup> within recent years on mice, guinea-pigs, rabbits, cats, and dogs show certain signs regarded by him as more or less pathognomonic of the condition. Subpericardial and subpleural ecchymoses, and more particularly subendocardial ecchymotic extravasations, occurred in most of his cases, combined with bloody emphysema of the larger bronchial ramifications. These signs, when taken in conjunction with the external burns, are believed by him to be sufficient to make the diagnosis "death by electricity." Rigor mortis occurred very rapidly and persisted for a distinct period of time. Macroscopically, changes in the brain and spinal cord were not prevalent, though in some there were subdural and intermeningeal hemorrhagic extravasations. Microscopically, minute capillary hemorrhages were also observed. These are of interest by way of comparison with similar findings by Peterson, and in cases of electrocution, as reported by Van Gieson. Changes in the morphology of the blood have been emphasized by earlier observers, but the careful work of Kratter and other recent writers would seem to prove quite conclusively that such do not occur save at the sites of electrode contact. More recently Cunningham<sup>3</sup> has shown that if the thorax be opened immediately following death, due to strong continuous currents or alternating currents of medium frequency, the heart on close examination will be found to show a minute quivering throughout its entire muscular substance.

<sup>1</sup> D'Arsonval, *La mort par l'électricité dans l'industrie*, Comptes rendus, April 4, 1887, vol. civ, p. 988.

<sup>2</sup> Kratter, *Der Tod durch Elektrizität*, Vienna, 1896, S. 61 et seq.

<sup>3</sup> New York Medical Journal, Oct. 28, 1899, pp. 581, 616.

CYTOLOGIC CHANGES IN DEATH BY ELECTRICITY (CORRADO).

The cells in this illustration for the greater part are from the medulla. Figs. 8, 9, 18, 19, 20, 24, 26, 27, 28, and 29 are from the cerebral cortex, frontal and parietal lobes. Fixation has been by means of absolute alcohol; staining by methylen-blue or thionin.

FIGS. 1-4.—Cells variously contorted.

FIG. 5.—Unilateral erosion of cell and of nucleus.

FIG. 6.—Laceration of side of cell with disappearance of nucleus and nucleolus.

FIG. 7.—Cell with irregular contour and irregular chromatic distribution.

FIGS. 8, 9.—Disappearance of part of chromatic substance. Fig. 8 shows loss of nucleolus.

FIGS. 10-12.—Irregular distribution of the chromatic substance with partial or complete loss of nucleus.

FIG. 13.—Irregular distribution of chromatic substance with vacuolization.

FIGS. 14-16.—Aggregated chromatic substance. In Figs. 15, 16, the nucleolus is outside of the nucleus.

FIGS. 17-20.—Various deformities of cells, eccentricity of the nucleus, loss of chromatic substance. Chromatolysis both central and peripheral.

FIG. 21.—Partial perinuclear chromatolysis. Hyperchromatosis of nucleus and nucleolus.

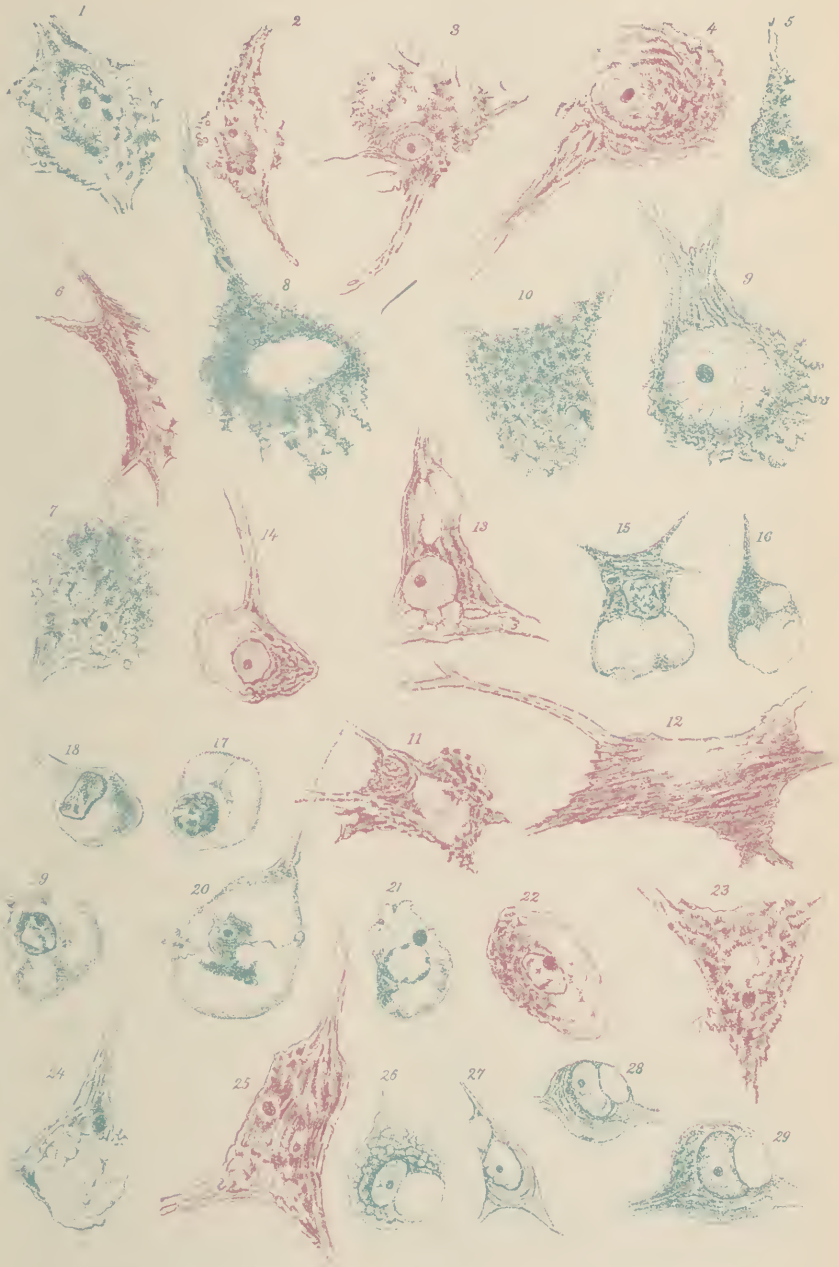
FIGS. 22, 23.—Nucleolus penetrating the nuclear membrane.

FIGS. 24, 25.—Irregular distribution of chromatic substance. Nucleolus peripheral.

FIGS. 26-29.—Cerebral cells fixed with sublimate which show regular vacuolization, and causing regular deformities of the nucleus.



PLATE 2.





A. Changes in the cell contour: (1) Noteworthy and various deformities, erosions, jagged outlines, lacerations, and even severe destruction of the cell outline. (2) The contour of the cell became hazy and diffuse. (3) In some cases the protoplasm became granular on one side.

B. Internal cell changes: (1) A grade of dissolution of the chromatic substances with powdery granulations was observed. The cell contents were more homogeneous and showed the beginning changes of chromatolysis. (2) Frequent and pronounced vacuolation (perhaps artefact). (3) The chromatic substances had a slight tendency to become dispersed in the remainder of the cell body, at times in distinct collections, which in certain parts of the cerebral cortex had a special arrangement. These collections of chromatic particles were not disposed in the direction of the passage of the electric current. (4) The nucleus is quite resistant. It may, however, be modified in shape, become diminished in size, or may entirely disappear. The contour of the nucleus may be irregular or even angular. The chromatic substance of the nucleus may be irregularly disposed, granular, arranged in fine, irregular filaments at the periphery, or it may entirely disappear, leaving the nucleus colorless. The position of the nucleus may vary. A certain tendency is manifest for it to be located on one side, especially to that side on which the accumulation of chromatic substances occurs. The nuclear membrane may be broken. (5) The nucleolus is the most resistant part of the cell. It is for the most part preserved and deeply stained, even when the remainder of the cell is profoundly altered. At times it may be diminished in size. It has a tendency to an eccentric position, being pushed out to the periphery of the nucleus or even to the periphery of the cell.

Corrado also describes a series of changes in specimens treated by the Golgi methods. These changes of the dendrites consist, for the most part, of varicose atrophy, fragmentation, and other modifications of shape and position. Since the Golgi method and its now known modifications show precisely such changes in normal material, it is fairly well established, by reason of this and also on account of the great lack of uniformity of the Golgi pictures, that it is unwise to describe degenerative lesions pathognomonic of any diseased condition. Hence these observations of Corrado by means of the Golgi method will be mentioned only.

Jellinek<sup>1</sup> has found in the cerebrospinal axis of those killed by lightning the same types of lesion as those here and hereafter described. Schwartz and Nothnagel (1903) held these might have resulted from asphyxia, but the evidence seems to point in another direction. Electrocutation has given the most accurately observed cases, and the investigations of Spitzka, Van Gieson, Kratter, and Jellinek are the most elaborate. In the case of William Kemmler, the first officially electrocuted criminal under the modified statutes of the State of New York, the following autopsy record is taken from the notes of George F.

<sup>1</sup> Loc. cit.



Shrady: "Capillary hemorrhages were noted on the floor of the fourth ventricle, the third ventricle, and the anterior part of the lateral ventricles. The circumvascular spaces appeared to be distended with serum and blood. The brain cortex beneath the area of contact was notably hardened. The vessels of the corpora striata were notably enlarged at different parts of their ramifications. The pons was slightly softened. The spinal cord showed no gross lesions." The abstracted report of the microscopic findings of Spitzka is as follows: The brain, spinal cord, and peripheral nerves appeared structurally healthy in every place examined except in the anemic and hardened areas. The hemorrhagic spots showed no vessel alterations. (The cytologic changes

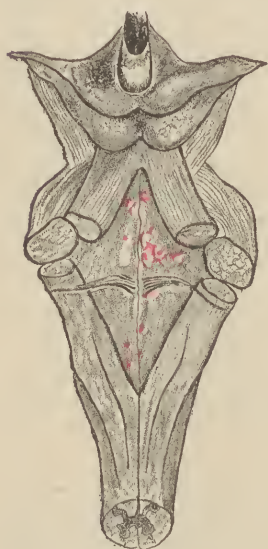


FIG. 137.—Showing the character and distribution of the petechial spots in the floor of the fourth ventricle in the case of Schichiok Jugigo (Van Gieson).

described by him are of little moment viewed from present-day standards.) The vacuolation of the ganglion cells described are those now recognized for the most part as being due to manipulative artefacts, hardening, etc., and cannot be brought into correlation with the later-day pathology of the ganglion cell (Ewing, Goldscheider, Turner, Barbacci, etc.). The histologic examinations of those paying the electrocution death-penalty, made by Van Gieson and others, are more extended, and since newer methods of accurate fixation and staining were in vogue, some clue may be gained as to the amount of cellular change. The details of the visceral examination do not need repeating, since nothing abnormal has as yet been found in any of the viscera related in any way to the method of producing death. Of the cases examined by Van Gieson, that of Schichiok Jugigo may be taken as a type. "The pia was uniformly thin and moderately congested. The blood was fluid throughout. The vessels at the base of the brain were normal.

The gray matter was normal. Floor of the fourth ventricle at upper half contained some dilated vessels, and on the left side there were a number of minute radiating petechial spots from 1 to 2 mm. in diameter. These small petechial extravasations show small masses of extravasated red blood-cells situated for the most part in the perivascular spaces just beneath the ependyma." The hemorrhage appeared as if a small vessel had given way, but whether such rupture was due to the current, to the muscular contortions, or to the effects of manipulation are not determined by the observer. In his summary of autopsy findings, after reviewing the results of a number of autopsies, Van Gieson notes the following: "(1) The passage of an electric current of the pressure employed in these cases (of approximately from 1400 to 1700 volts)

and in this manner does not do any damage to any of the internal organs, tissues, or muscles. None of these parts are lacerated or changed in volume; neither are there any gross chemical or morphologic changes or alteration of their finer structural features. (2) The local thermic effects of the electrodes are limited to the scarf skin. (3) The occurrence and distribution of the minute hemorrhagic spots are not uniform or constant features in these cases; and as they are found after death from a great variety of causes, they cannot properly be regarded as positively characteristic of death by this method."

Observations on man, which can be used to compare with those of Corrado for dogs, are still lacking. For man it cannot thus far be said, therefore, that the observations of Corrado on dogs have been verified, etc.<sup>1</sup>

**Causes of Death by Electricity.**—From the time when the "Gods were displeased with the children of men" to the present, specula-



FIG. 138.—Showing the character and distribution of the petechial spots in the floor of the fourth ventricle in the case of Schichiok Juggio (Van Gieson).

tion has been rife with the question as to the cause of death by electricity. The earlier observations have been collected by Arago,<sup>2</sup> and we are indebted to him for a large number of interesting facts. Among the earlier observers John Hunter taught that death was due to the "instantaneous destruction of the vital power." Brodie believed that the action was on the head. Edwards wrote of the disorganization of the nervous system. Robin claims that death was due to asphyxia. Schneider in 1833 taught that the electric current did not traverse the body, but spent itself on the surface, thus causing the extensive burns, and death was due to the shock of the nervous system. Stricker's

<sup>1</sup> Also consult Cayla, P., *Les Brulures par les courants de haut voltage*, Paris Thesis, 1912. Moorhead, loc. cit. Jellinek, *Wien. klin. Woch.*, 1912, p. 962. Hewitt, *Missouri State Med. Association Journal*, Sept., 1913.

<sup>2</sup> F. Arago, *Sämmtliche Werke*, Ueber das Gewitter, Deutsch von W. G. Hankel, Bd. iv, Leipzig, 1854.

observations, commented on in the section on Pathology, were among the first series of studies of the more modern period. Reports of autopsies are more frequent from this time, and experimental work has been greatly amplified. It is worthy of mention, in passing, that Priestly, in 1766, and Fontana, in 1775, made a number of elaborate experiments.

The modern epoch of experimental work may be said to have been inaugurated by Nothnagel, of Germany, in 1880, by Brouardel, Grange, and Gariel, in 1884, in France, closely followed by Brown-Séquard and d'Arsonval, in 1887. By Kratter, in Germany, and by Biggs, Donlin, Houston, Jackson, Knapp, Peterson, Robert and Terry, in America; with the later studies of Taum, Jones, Bleile, Oliver and Bolam, and Cunningham. From the pathologic point of view the work of Nissl, Hodge, Levi, Lugaro, Mann, and Corrado<sup>1</sup> is to be borne in mind.

From the foregoing brief summary it may be seen that the entire possible theoretic ground was covered by the earlier observers, but their investigations lacked the precise experimental evidences demanded at the present time. The investigations of Nollet, Grange, d'Arsonval, Peterson, and others mark the earlier steps in the progress of the elucidation of our knowledge concerning the phenomena of death by electricity, while the other investigators just mentioned have brought the question to the present time with some definite conclusions. D'Arsonval's and Brown-Séquard's earlier hypotheses were received more widely than those of other writers, and have been extensively quoted, but within recent times many of their conclusions have been questioned. D'Arsonval taught that death was produced in either of two ways, or, perhaps, by the concurrent action of both: (1) By direct action during which the disruptive action of the current produced mechanical alterations in the tissues and thus altered their physiologic activities. (2) By direct or reflex action, whereby the important nerve centers of the medulla were affected in their physiologic functions which induced death.

Brown-Séquard later amplified this indirect action on the nerve centers. D'Arsonval again brought up the question, first promulgated by Grange, that the electric current could bring about effects simulating death, but the subject could be recovered by artificial respiration, to which reference will be made further in the discussion.

Cunningham's<sup>2</sup> very able summary of the experimental data following the epoch of d'Arsonval is here freely used. The researches of later writers clearly led to the conclusions that neither the results of experiments on animals with strong electric currents, nor the numerous reports of pathologic findings in the bodies of men killed accidentally by the electric currents of commerce or legally electrocuted by the high tension current employed by the authorities in New York State are in the least corroborative of the hypotheses of these French investigators. Cunningham's experiments bear out the conclusions of the later writers,

<sup>1</sup> For bibliography of this recent work see: Barbacci, *Centralblatt für allgemeine Pathologie*, 17, 18, 1899; Jelliffe, *Archives of Neurology and Psycho-Pathology*, vol. i; Ewing, *Ibid.*; Turner, *Brain*, 1899.

<sup>2</sup> Cunningham, *New York Medical Journal* (loc. cit.).



who find that in the higher animals the chief lethal effect of both the continuous and the alternating currents is due to their action on the heart. Thus, in order to bring about fatal results, very much stronger currents are necessary when the electrodes are applied to both sides of the head. A complication of the problem arises from the fact that death may take place in different ways, according to the path traveled by the electric current. Thus the work of Cunningham and others has shown that if death results from the more or less prolonged passage of a strong current through the exposed brain and upper spinal cord, the lethal effect is plainly the result of asphyxia; while in a second class, where the stream of even a moderate current traverses the heart for a brief period only, the deadly result is due to the interference with the co-ordinating power of the heart, which takes place suddenly and is permanent, causing the central nervous system to die of anemia. A corollary of this fact is the indication that death by electrocution could be caused in a shorter time and with greater certainty if the electrodes were so placed that the greater part of the electric current were made to traverse the heart directly. The cerebrospinal arc should be included, however, in the path of the current in order to still the respiratory as well as the cardiac movements. As pointed out in the section on pathology, the heart in animals killed by electric current is found to show a condition of "delirium cordis," or "fibrillary contraction." This is what leads Cunningham to assert that death by commercial electric currents, as well as death by electrocution, is due for the most part to the fact that the electric current induces fibrillary contractions of the heart. The summary of conclusions by Cunningham is here given: (1) Industrial electric currents which traverse the whole body transversely or longitudinally in sufficient intensity kill because fibrillary contraction of the heart is produced, and not, as has been hitherto surmised, by producing a total paralysis of that organ or by killing it outright. (2) Such currents neither kill the central nervous system outright nor paralyze it instantaneously. Death of the nervous system from such currents is due to the total anemia following a sudden arrest of the circulation. (3) In rare cases, when an electric current traverses only the cerebro-cervical portion of the nervous system, in considerable intensity and for a considerable length of time, it may kill by asphyxia, consequent on a more or less complete inhibition of the respiratory movements, which occurs chiefly during the passage of the current. No existing facts warrant the conclusion that the medullary respiratory center is paralyzed or killed in such conditions.<sup>1</sup> (4) Industrial currents are practically non-lethal to frogs and turtles, as the condition of fibrillation quickly and spontaneously disappears from their hearts after the current has ceased to pass. Such animals can, of course, be killed by the very prolonged application of a current of moderate intensity or by one of enormous voltage and large intensity. (5) Strong electric currents applied to the surface of the skin affect the heart in the same

<sup>1</sup> Corrado's observations, while not disproving this statement, throw some important light on the pathologic processes taking place in the medullary centers.

manner as currents of less strength do when they are applied directly to the exposed heart. (6) It may be possible for an electric current of enormous intensity and electromotive force to produce instantaneous death either by its disruptive action or by producing an instantaneous heat coagulation of the cellular constituents of the body. Industrial currents do not kill instantly, although, as a result of their action, death rapidly occurs. The experience of individuals who have recovered from severe electric shock indicates that such a mode of death is not a painful one.

Since, from a pathologic point of view, the critical analysis of the cellular changes described by Corrado does not enable one to say what the *initial* cause of the cellular destruction may have been, the results of physiologic investigation must be accepted; and since independent observers—Cunningham, Prevost, and Batelli—have come to similar conclusions, it seems that the question of the cause of death by electricity has an authoritative answer in the conclusions just quoted.<sup>1</sup>

**Certain Questions of Death and Recovery.**—From all the evidence at command, clinical observations and experimental data, it is probable that death takes place instantly—*i. e.*, for all practical purposes. Theoretically it can readily be seen that if death results from secondary anemia following cardiac fibrillation it may take a few seconds for the nervous tissue to disorganize. The evidence derived from non-fatal cases is, however, of great interest, for here personal experience with patients and the writings of others show that a number of individuals who have been rendered unconscious have recognized in the brief moment of consciousness the experience of a strange sensation. Some have recognized what the character of the sensation was, and the general experience has been that this sensation is not painful, but is only an exaggeration of the uncomfortable feeling induced by an ordinary faradic battery. As for the sensations experienced by those who have died, it seems probable that if death occurs by the method of direct cellular disorganization, no sensations are experienced, whereas if death occurs by the second method, that of cardiac fibrillation and consequent anemia, it is not improbable that some momentary recognition of strange perceptions mounts to the threshold of consciousness. Whether they enter the full field of consciousness and give rise to the sensation of great pain must only be surmised, though it seems probable that such is not the case from the evidence to which brief allusion has been made. Recoveries from the shock of lightning or electricity which has brought about unconsciousness are very common. There is, however, a wide-spread and natural lack of certainty in the minds of technical students, as well as the laity, as to the border-lines which separate the recoverable from the fatal cases. Closely related to this is the practical question of how best to treat a patient in order to bring about recovery. In the milder grades of accident a certain amount of muscular fixation brings about a loss of respiratory movements with conse-

<sup>1</sup> Consult the able summary by Jex-Blake, *British Medical Journal*, March 1, 1913.

quent asphyxiation. Recovery in such cases is extremely probable. In the severer grades the problem to solve is, whether there is a point where asphyxia passes over to the border of cellular degeneration or whether cellular degeneration is primary? If the latter lesion is present, recovery is impossible and therapeutic agencies futile; if the former, methods of stimulation of the respiratory centers may be of benefit, or, if the heart is in the condition of cardiac fibrillation, some efforts should be made to bring about co-ordination.

**Treatment.**—In the treatment of electric injuries promptness is imperative. If commercial currents are the cause, careful efforts should be made to remove the patient from the current at once. The rescuer's zeal should be accompanied by caution. Some insulating material, rubber gloves, blankets, or cloths should be used in handling the wires.

External heat to the body, artificial respiration, and cardiac stimulants should be used simultaneously. The method of Dr. P. J. Gibbon has been extensively employed. The patient must not be touched with the naked hands, but may be dragged away by his clothing, or removed from contact with the earth by slipping a board under him, to break the current, or from contact with the "live wires" by raising them with a stick? As soon as he is free from the current, either by the turning it off or by the removal of the patient, efforts at resuscitation should be begun along much the same lines as are followed to restore a drowning person. The crowd should be dispersed to give the patient air. He should be laid upon his back, with a rolled coat placed under the shoulders to support the spine and let the head fall backward. Then any well-known methods of effecting artificial respiration should be begun. Dr. Peter J. Gibbon says that the two prime indications in the treatment of prostration by the electric shock are, first, to restore the respiratory system, and, second, to promote warmth and circulation. To restore the respiration, Gibbon recommends the insertion of the distal end of the tube of his apparatus into the nostrils or mouth. This apparatus consists of a simple pair of bellows, so constructed that when the handle of the bellows is raised the air rushes from the patient's lung into one compartment of the bellows; simultaneously the other compartment is filled with fresh air through a tube on the reverse side. The air is forced into the lungs by compression of the handles. This instrument, it is claimed, is more certain and expeditious in restoring suspended respiration in persons who have undergone electric shock, taken poison, or been long immersed in water, than any other method in use. The nostrils should be excited with snuff, hartshorn, or smelling salts, any of which may be introduced with the fresh air into the bellows. The tongue should be grasped with a cloth and pulled out, thus stimulating the sensory nerves and producing a reflex action on the principal motor nerves distributed to the muscles of respiration.

To restore circulation the patient should be wrapped warmly, hot bottles or bricks being placed at his extremities, between the thighs, and under the armpits, care being taken not to burn him. He should not be rubbed until he begins to breathe, and on no account should he be

taken into a close, warm room. When respiration is established the limbs should be rubbed upward briskly. A physician may insert the distal end of Gibbon's apparatus tube into the laryngeal entrance or do a tracheotomy. He can also keep up body heat by means of electric batteries.

No method should be discontinued under from three to six hours. Often no signs of life are seen for from one to two hours, but are manifested later. Before giving up all hope, the injection of an alkaline solution is recommended, as in the case of people who have bled to death. After artificial respiration ceases, it may be that nature fails to perform its duty, and it must be resorted to again until life is fully re-established.<sup>1</sup>

<sup>1</sup> For recent bibliography to 1913 consult Goulstonian Lectures by Jex-Blake, British Medical Journal, March 1, 1913.



# WOUNDS

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INJURIES or wounds are of importance to those interested in or employed in the practice of medical jurisprudence. In surgery a wound is defined as a solution of continuity of the external coverings of the body, its mucous membranes, or the surfaces of organs. They are classified as simple if the deeper structures, such as the muscles, nerves, large vessels, bones, body cavities, and joints are not affected; as complicated if they are.

In law the term wound or injury has a wider meaning, for it is not employed entirely in a technical sense and includes other conditions than those accorded it by authors of surgeries. "Any lesion of the body, whether cut, bruise, contusion, fracture, dislocation, or burn," is considered in law a wound. The words "blow" and "wound" have been considered synonymous in meaning. In this sense the vulnerating force must cause damage which interferes with function or causes some definite injury. Scratches, even if they do cause a certain solution of continuity, are not considered wounds, for here the damage done is slight and the associated danger not great, however much discomfort may be caused, and wounding is not considered to have taken place.

A wound, according to law, must be an injury which does damage to the part affected. An incised (cut), punctured (stab), or contused (bruised) wound or a break is followed by more or less loss of function, often of substance, of the tissues involved. According to circumstances, depending upon the character of the wound and the tissues involved, the results may be slight, severe, dangerous, or fatal. The results of a slight wound may at first seem trivial and may become dangerous or fatal because of certain factors over which the person affected has no control. The character of the wound is, therefore, of importance. The degree of importance is decided by the district attorney upon statements made by the physician or surgeon. The physician or surgeon decides from his knowledge of such matters whether no further danger will probably arise from the wound or whether the general condition of the patient is such that healing may become difficult or impossible.

When a wound is the subject of judicial inquiry the surgeon must exercise care in giving a prognosis. An assault may be made and the victim rendered unconscious by a blow upon the head. The victim may recover consciousness within a few minutes and appear to be in good, even normal, condition. Within a few hours the victim may pass into

coma due to pressure from an extradural or subdural hematoma or may subsequently develop a brain abscess. Either one of these conditions may follow a blow upon the head from which the victim seemingly recovers. If the medical man should give a certificate that the victim had recovered from the danger of the assault, during the early, seemingly normal period, he would make a mistake. Good judgment must be used in the matter of giving certificates regarding injuries. The accused as well as the victim has rights which must be observed. If, as in the cases just cited, a superficial examination is made, the certificate would give insufficient data. If care is taken in the examination, and the surgeon refuses a certificate because of the symptoms and circumstances under which the blow was delivered and because of his experience in such conditions, the magistrate will uphold him, if the reasons given are founded upon and supported by the authorities on such injuries.

Wounds should be carefully studied, for the evidence given by them is important. The character of the wound; the probable method of infliction, the weapon employed, the direction in which the vulnerating force was applied; whether the wound was self-inflicted or caused by another, whether it occurred during life or after death must all be considered. The evidence wounds give may be of greatest importance. Usually wounds tell their story in no uncertain tongue. Too much care cannot be employed in determining every characteristic of a wound. Its position and relation to definite fixed points of the body, the character of its edges, the color of the adjacent tissues, its size in all directions should be carefully determined in order that a thorough and absolute knowledge may be had from which deductions can be drawn as to the character of the vulnerating force and the way and direction in which it was applied.

**Classification of Wounds.**—Wounds may be classified as *open* and *subcutaneous*. In the open wound there is a solution of continuity of the skin, while in the subcutaneous wound the skin is not broken, although the underlying tissues may be severely injured, a solution of continuity occurring, for example, division of the external popliteal nerve or rupture of the liver or spleen. Open wounds depending upon the vulnerating force and their characteristics are classified as **incised, lacerated, punctured, contused**. If produced by a bullet or a shot as **gunshot** wounds. If a poisonous substance is introduced, for example, curare on an arrowhead, they are referred to as **poisoned** wounds. Fractures and dislocations as well as burns are considered as wounds or injuries.

A wound is usually regarded merely as a wound by the layman, who pays but little attention to the different varieties constantly referred to in surgery. The medical expert should bear this in mind and not be too technical in his description of various wounds, for a technical discussion may confuse and not clarify. The different characteristics of wounds should be well understood by a witness. After once having clearly stated the character of the wound it is usually only necessary to refer to the wound without attaching the descriptive adjective.

A medical witness should be careful in certifying as to the nature

of a wound—the result of a homicidal or criminal assault. In such instances the question naturally arises, What wound is dangerous to life and what length of time must elapse after the wound is received before doubt no longer exists as to recovery from the same? It is evident that in some wounds, which may be dangerous, life is not immediately threatened, but complications may arise later which cause death. In such cases the surgeon's must be a justified opinion as to the gravity of the wound and the prognosis. The question of holding the prisoner in restraint depends upon such a statement. If the wound involves a cavity such as the chest or abdomen, or if the violence has been applied to the head, causing a fracture of the skull which may be accompanied by a hemorrhage or a contusion of the brain, it is proper to state that the wound is dangerous to life. The reasons that such a wound is dangerous may be easily given by the medical witness if chance for a cross examinations is given by the accused's counsel. Such reasons are usually conclusive. If the wound were a serious one but not dangerous to life unless secondary complications should arise, the witness could not say the wound was of the magnitude of those just described. Some wounds which upon their reception seem to be very severe, are found to be not so when a careful examination is made. Caution must be exercised concerning the prognosis of wounds, and for that reason the surgeon making the certificate would better give a full description of the wound stating why it is dangerous and when the dangers may arise and how much in his opinion life is threatened, leaving the court and prosecuting officer to decide what action should be taken in such conditions. Plain, simple English should be employed when one is writing for, or giving testimony before, courts. Lawyers, although belonging to a learned profession, do not any more than the layman understand all of the technical terms employed in medicine and surgery. A medical expert may dilate learnedly upon a case, using freely terms with which he alone is familiar and give a brilliant exhibition of great erudition to a crowded court room, only to be quietly asked by judge or counsel to "please put that in English so that ordinary mortals may understand you." This conduces neither to comfort nor reputation.

**Wounds Made On a Body After Death.**—At any time the question may be raised whether the wounds found on the body were not made after death. Whether death was due to the wound will be determined by the autopsy, the technic of which will be described elsewhere.

If pus is found in a wound, this is evidence that the wound must have been inflicted before death, for pus is a by-product of the reaction of living tissues to invading organisms. If, however, a wound on the dead body should have similar characteristics upon the living the question as to when the wound was inflicted could not be so easily settled. If the wound is an incised one and is made long enough after the body heat has passed off and rigor mortis has set in, the character of the wound is usually such that it is pretty certain that it was inflicted after death. In such a case, the skin having lost its contractility, is not everted and the deeper tissues do not gape. If blood exudes from such a wound it is



venous and coagulates slowly if at all and clots are not found in the wound. If the wound is inflicted immediately after death or within as early as half an hour afterward the signs are not so positive. The contractility of the skin and muscles has not been lost at this period, rigor mortis is still absent, and as a result the wound may have much the appearance of one inflicted during life. It is difficult in such a case to state definitely when the wound was inflicted and a guarded or reserved opinion must be given. Blood-clots may be found in a wound made shortly after death and these are usually more or less closely attached to the edges of the wound.

If when the incised wound is made an artery is divided definite evidence may be found which indicates the time relative to death at which time the wound was made. If a fairly large vessel is divided, the spurting that follows if the heart is still active, indicates arterial hemorrhage and spots of blood thrown from the vessel will be found upon the surrounding parts and clothing. A similar wound made after death naturally is not associated with any such bleeding. After death the blood flows by gravity from full veins and there will be no evidence of spurting. The color, however, may be that of arterial blood, oxygen having been absorbed from the air. Spurting from a divided artery may however, be interfered with by the direction of the wound, the spurting being prevented by the sides of the wound. In such a case the difficulty in determining the time relative to death at which the wound was inflicted is increased. The same difficulties are found in lacerated wounds. Arterial spurting is rarely as marked in these as in incised wounds, for the torn intima retracts and rolls up within the vessel plugging the lumen and besides clotting occurs preventing spurting. Another element may come into consideration in deciding the time of reception of a lacerated wound. This element is bruising, for frequently such wounds when homicidal are made by a dull weapon and in addition to the solution of continuity of the tissues there is a contusion.

Wounds that divide the skin and deeper tissues when made on the dead do not bleed as much as those made on the living body. The bleeding is venous and the flow is by gravity. The ooze takes place therefore from the dependent portions of the wound rather than from its entirety. It does not well up and flow over as in the living body. Again, in the dead, capillary bleeding does not take place, and this may be an aid in determining the question as to the time when the wound was inflicted.

In a contusion or bruise without solution of continuity of the skin the same characteristics are not found on the dead body, unless inflicted immediately after or within a short time after death, as in the living. Christison gives two hours as the time when blows upon the dead body cease to resemble those upon the living. Experiments indicate that much greater violence must be used to make a contusion resembling one made before death, for the capillaries do not contain as much blood after death and the discoloration or ecchymosis following a blow is mostly due to the rupture of these vessels and the subsequent effusion of blood



into the skin and subcutaneous tissues. A contusion or bruise made after death, while it may resemble very closely one inflicted during life, may be differentiated from such a one if an incision is made into the tissues, for the blood will not be so generally and completely diffused in the true skin in the contusion made after death. Should the wound be made after the body is cooled and rigor mortis established the determination as to the time relative to death that the wound was inflicted may be an easier task for the reasons already given when incised wounds were discussed.

In fractures produced after death the amount of blood about the torn muscles and fractured ends is much greater when the fracture was caused before death. The track of a bullet made in living tissue differs from those made in dead tissue by the amount and extent of diffusion of the blood. Blood is not effused in the same way from dead as from living vessels and the bleeding about a fracture caused after death is not only less in amount but is also more circumscribed, coming as it does from veins torn by the ends of one or both fragments. In the condition mentioned above care must be exercised in giving an opinion and unless the appearances are such as to warrant an unqualified statement that the wound under consideration was inflicted after death, the most that can be said is that the wounds were received either just before or just after death.

**Wounds of the Living.—Contusions.**—ordinarily known as bruises—are wounds caused by dull weapons such as a club, stone, sandbag, iron bar, etc. A contusion may be associated with a solution of continuity of the skin and more or less tearing of the tissues, making a combination of a contused and lacerated wound. The appearance of a simple contusion is quite characteristic. The blow at first causes redness at the point struck. The redness becomes darker and soon becomes bluish, later yellowish black.

Redness appears first in the area to which the force is applied. The redness soon becomes more dusky, and then bluish black, and finally yellow. This discoloration, which is caused by the changes occurring in blood effused into the tissues of the true skin and the loose cellular tissues beneath, is called an ecchymosis. Such a discoloration may not appear until after death, for when the deeper tissues are injured the blood may not reach the cellular tissues beneath the skin and the skin proper for some hours. At times in such cases there is no evidence in the skin proper of a vulnerating force having been applied. If firm resistance against which the force is applied is beneath the soft tissues, the discoloration may appear rapidly—sometimes being present within half an hour. If the force is transmitted to deeper structures or a fracture is produced the discoloration may not appear for from twenty-four to thirty-six hours or later. It may then appear at a point distant from the one to which the force has been applied. In such instances the blood that is effused requires some time to gain the subcutaneous tissues and skin and traveling along the lines of least resistance, along intermuscular septa and fascial spaces, may appear in areas distant from that to

which the force was applied. The late appearance of such an ecchymosis should be remembered, for ecchymosis from deep bruising and fracture may make its first appearance after death, even when the subject of the assault has lived for a day or two after the force has been applied.

When the contused or bruised area has a red or dark red center, or a blue color, the decision that such a blow was received during life must be cautiously made—a blue ecchymotic area may be said to have been caused shortly before or immediately after death—after death the red turns to blue. In making the decision other circumstances associated with the death must be taken into consideration. If a contusion has other color than blue, it is positive evidence that the wound was inflicted during life, for, when the effused blood clots and the clot contracts, serum is expressed and changes in color occur in the raised tissues. The color changes from blue to nearly black, then to purple, violet, green, yellow, which gradually fades into the natural color of the skin.

No ecchymosis may follow a blow upon yielding structures, such as the abdomen. The abdomen is so yielding that the force of the blow may be transmitted through it to the abdominal organs. Such a blow may rupture the liver, kidney, spleen, bladder, or intestines and still no evidences of its application appear in the tissues of the abdominal wall.

An autopsy reveals the conditions and will probably show that the injury was received during life. Violence associated with falls in which the violence is not directly applied to the abdomen may also cause rupture of the viscera mentioned, but the history in such a case will usually give a clue as to the nature of the injury. Falls may cause contusions to other parts of the body similar to that produced by weapons, and the medical examiner has to weigh all the evidence he can collect as to the probable cause of the injury before he can give an opinion. The most that he may be able to say in many cases is that "such an injury could be caused by a weapon similar to the one shown in evidence or by others of like character, or a fall could have produced it, but there is nothing about the injury *per se* that would decide how it was inflicted."

Contusions or bruises produced by a sandbag do not show on the surface even though bone lies close to the skin. The sand is not tightly packed in the bag and spreads out at the moment of contact and the force is thus diffused. The capillaries escape rupture, but the deeper tissues may have blood effused into them and ecchymoses may eventually appear. Even harder substances may have the same effect.

In 1895 a medical expert was asked by the District Attorney of Albany County to make an examination of the body of a man named Near who had been found dead. Circumstances pointed to homicidal assault. The coroner's physician had already held an autopsy, but the prosecuting officer was not satisfied with his report. It was stated that the man was jumped upon. He was drunk at the time and clots were found over the brain. It was stated that these were due to apoplexy induced by alcohol. No dissection had been made of the neck or shoulders, the parts claimed to have been injured by the feet of the prisoner. Dissection of the back of the neck revealed two blood-clots near the

spinous process of the fifth cervical vertebra. No marks of external violence were found upon the neck. The assault had been committed about 9 in the evening and the man was reported to have been found dead next morning at 7. The spinal cord was completely surrounded by blood-clots. Violence had undoubtedly been done the neck and back and deep effusion had followed, but no external bruises or abrasions were found. One witness stated that an assault had been committed. It is probable that the absence of bruising was due to the clothing. It could not, however, be settled whether this theory was correct. Clots were, however, found in the deep tissues of the neck and some force must have been applied to produce them.

**Incised Wounds—Wounds Caused by Sharp Instruments.**—An instrument with a sharp edge when cutting tissues produces an incised wound. In felonious assaults, knives, swords, hatchets, axes, or some similar instrument is used. Tin, glass, sheet iron, a sharp piece of wood, etc., cause an incised wound. Heavy weapons, such as axes, hatchets, and the like, not alone cut, making incised wounds, but also crush the tissues, making a bruise or contusion as well. If the cutting edge of such an instrument is dull, the tissues are contused and lacerated as well as incised. The character of the weapon used is suggested by the appearance of the wound. A razor or surgeon's knife makes a finer and cleaner wound, as a rule, than does a thick-bladed knife which is somewhat dull. An incised wound gapes. The amount of gaping depends upon the relation of the wound to the tension planes in the skin and the muscles. An incised wound made across muscle gapes more than one made parallel to muscle-fibers. Gaping occurs as soon as the wound is made, for the muscle contracts and the edges of the wound are drawn apart. The skin edges of such a wound become everted. The same general appearance is noted in wounds made immediately after death upon the dead body, for muscle contractility has not been lost, and practically the same conditions are found as in the living, excepting as regards bleeding. In life bleeding depends upon where and how deep the cut is made and whether arteries are severed.

Some years ago a physician was called from his carriage to see a woman who had just committed suicide. The body, lying in an out-house, was doubled upon itself upon the floor and the wall all about was spattered with blood nearly to the ceiling, which was low. The woman was dead, the body warm and flaccid. Evidently she had been dead but a few moments. The blood in the wound, on her clothing, and on the floor was clotting. The bleeding, as shown by the marks on the wall, occurred from an artery during life. Although life had lasted but a few moments after the wound was made, the distribution of the blood marks showed that spurting had occurred. The wounds this woman had inflicted on her throat were across muscle-fibers which gaped, giving the vessels ample opportunity to spurt.

When the wound is parallel to muscle-fibers the hemorrhage may be less violent, as the wound does not gape so widely and the flow of blood is retarded. Even in such cases, however, the bleeding may indicate



whether the wound was made before or after death, for the bleeding which occurs during life is more abundant than that which occurs when a recently dead body is cut. In wounds made upon the living body clotted blood is usually found in the wound. To a certain extent this statement is also true of incisions on the dead if made immediately after death or before any appreciable fall in body temperature. The clots found in the living are more adherent to the adjacent tissues than those found in the dead. Less clotting occurs in incised than in lacerated wounds. Clotting of the blood is but an indication as to the time relative to death that the wound was inflicted, and unless there are other and more marked evidences as to the time of infliction the statement that the wound was made prior to death could not be based upon the clotting alone.

The way in which the skin is divided indicates the way in which the cut or incision was made. The skin being elastic yields before the knife and then springs back unless the knife or instrument used is very sharp. As a consequence the beginning of an incised wound is often nicked or jagged, appearing as if more than one effort had been made to cut it. The force of the cutting edge is usually greatest at the point where first applied and the wound is, as a rule, deeper at the beginning of the wound than at the point where the knife leaves the incision. When the knife is withdrawn it tails out, as the saying is, thus giving another indication of direction. Incised wounds are most frequently straight, but they may be curved, even triangular. Cuts made by glass, tin, etc., are more apt to be curved, triangular, and irregular than wounds made by a knife.

Incised wounds present the most favorable conditions for healing, and unless infected, if the edges are closely approximated, heal by primary union. It may be necessary for the medical jurist to pass up wounds not recently made where the question of time of infliction is not related so much to death as to other matters—for example, the time of assault. If the lips of the wound do not adhere or infection occurs, the wound heals by secondary intention or union. When the wound does not close bleeding continues longer, the blood becoming thinner and mixed with serum. Later the discharge becomes entirely serous in character. On the fourth or fifth day red points or granulations appear on the surface of such a wound. Pus is frequently seen in such a wound, but does not appear unless infection occurs, so that it is not a necessary accompaniment. The granulations increase in number and size, gradually filling up the wound. They develop eventually above the surface of the wound, giving rise to what is called “proud flesh.” A delicate skin which is first bluish, later red in color, develops from the edges of the wound and covers the granulation tissue. This red scar becomes white as it becomes older. The scar is a little below the level of the skin. When healing has occurred by secondary intention or union the scar is wider than when healing by primary intention or union has occurred.

When healing by primary union or intention occurs the scar is represented by a delicate red line. A crust or scab, formed from blood-clots, may be found along the line of such a wound. Such a scar becomes



white, but is not so much depressed as the scar which follows healing by secondary union or intention. After a wound has healed and the resulting scar has turned white the opinion as to when the wound was inflicted can only be conjectured. Before this happens a fairly good idea may be formed of the time elapsing between the time the wound was inflicted and the subject examined.

When the head is injured by a stick or fall, a wound may result which closely resembles that made by a knife. This is especially so when the wound occurs at the back of the head or over the eyebrow. The solution of continuity in such a case is not produced by the vulnerating force, but by the bony ridges found under the scalp in these locations. These are not incised wounds strictly speaking, and the scar which follows healing is apt to be broad as a consequence of the sloughing which occurs, the tissues adjacent to those severed being killed by the force causing them to separate.

The prognosis in incised wounds depends upon their situation and size. The prognosis as regards life is good unless some large vessel has been divided and profuse bleeding occurs, or a body cavity, such as the abdomen, has been opened. Whether crippling will be associated with the wound depends upon the extent and location of the wound, upon the character of the healing process, and upon whether nerve trunks and muscles are severed and not repaired.

**Punctured Wounds.**—A weapon or instrument which penetrates makes a punctured wound. Stabs, whether made by a knife, bayonet, file, scissors, or any other weapon, are punctured wounds. Any weapon or instrument which leaves a narrow and deep wound, although the depth may not be great, makes a punctured wound. Punctured wounds have been divided into four classes: (1) Punctured wounds made by cylindric or conical instruments; (2) wounds made by sharp-pointed and cutting instruments; (3) wounds made by instruments with ridges and edges; (4) wounds made by irregular perforating instruments.

In wounds of the first class, such as those made by a needle, no mark may remain in the tissues penetrated, as the tissues are merely pressed aside and not divided. If the instrument or weapon is larger, even though round, the wound is different. Generally the skin wound has two sharp angles and two sides of equal length, with but little if any retraction of the edges of the wound. When several punctured wounds are made the long axis of the wound will be in the same directions if the wounds are on the same part of the body. If upon different parts, for example, over the shoulder and loins, even though made with the same instrument and at the same time, it will be found that the long axes of the wounds in these two locations do not correspond. The axis of the wounds will be determined by the direction of the tension planes of the skin which vary in different parts of the body. When the fibers of the skin pursue different directions, for example, near the spine, the punctured wound may be irregular in shape and appear as if made by a triangular rather than by a round instrument. As the skin, as a result of the direction of its fibers, influences the shape of the external wound,

so the deeper tissues, because of differences in direction and elasticity, influence the deeper parts of the tract of the punctured wound. The shape of the wound in the deeper tissues may, therefore, vary from that in the skin.

The appearance of the wound gives some indications as to the size of the weapon used. Regarding punctured wounds Dr. Woolsey writes as follows: "When large, they are smaller than the weapon, as the splitting of the skin has certain limits, and also owing to the elasticity



FIGS. 139, 140.—Punctured incised wounds of the left hand, made by a knife.

of the skin, which is put on a stretch by the weapon and relaxed on its withdrawal. When such wounds are small, they are larger, as a rule, than the instrument causing them."

The second class of punctured wounds includes those caused by bladed instruments with a sharp point and one or two cutting edges. If a punctured wound is made by a knife and the blow be perpendicular to the part struck the wound may indicate the kind of knife used, as the angles of the wound would show whether there were one or two cutting edges. This cannot always be relied upon, for, as in the wound

made by the round instrument in which there is a slit-like opening, so with wounds made by a knife with a blade having a back, the angle made by the back may at times be indistinguishable from the one made by the edge. The depth of such wounds varies. If the wound exceeds in depth the length of the blade of the instrument suspected it is no proof that the wound was not made by this instrument, for the force of the blow may depress the tissues of the part struck, permitting the point to reach deeper tissues. For the reasons mentioned while discussing wounds made by cylindric and conical weapons, the skin wound made by a knife may be shorter than the blade is wide and the wound in the deeper tissues may seem broader than the thickness of the blade because of the contraction of the tissues severed. All stab or punctured wounds are not made by a weapon applied at right angles, and as a result the wound may be much longer, appearing like an incised wound, for the point entering obliquely allows the cutting edge to divide the tissues opposed to its course and leaves a larger wound. The direction of such a wound may be surmised for the way in which the skin is divided, as in incised wounds, indicates the direction from which the force was applied.

In the third class the weapon, such as a bayonet and foil, is provided with ridges or cutting edges. If the point be sharp and the edges sharp enough to cut, the wound will have edges corresponding in number to those on the weapon; otherwise the wound resembles that made by cylindric and conical weapons. The wound does not, however, always reveal the character of the instrument, for the skin may be cut in more places than there are edges on the weapon and may have a stellate appearance. The wound usually, however, suggests the character of the weapon and forms a guide for an opinion.

In the fourth class the wounds are made by an irregularly shaped weapon applied with great force, and the wound appears more like a contusion accompanied by a breaking of the skin. The wound does not indicate the character of the weapon as do those just described. But for its penetration it would not be classified as a punctured wound. Penetration alone is the guide to the character of the assault.

Punctured wounds heal in much the same way, if the same conditions are provided, as incised wounds. Unless some large vessel or nerve is divided, body cavity entered, or infection introduced they heal rapidly, leaving small scars and not interfering seriously with function. Punctured wounds of the fourth class heal by secondary intention as do lacerated wounds. The prognosis depends upon their location and the associated injuries.

**Lacerated Wounds.**—When the tissues are torn rather than cut by the vulnerating force the lesion is spoken of as a lacerated wound. At times such a wound resembles very closely an incised one and may be mistaken for one, especially when it is located upon the scalp. It has already been mentioned that two places on the scalp will apparently give a clean cut by the bone dividing the scalp from within out, a blow or fall furnishing the necessary force. It is also a fact that a similar

wound may be caused by a like force acting upon the smooth parts of the cranium. Lacerated do not usually bleed as freely as incised wounds. The arteries are torn and spurting of blood is not so common. There are exceptions to this general rule, however, for in wounds of the scalp which have been made by blows of a club or some other blunt object the arteries often spurt as freely and forcefully as when cleanly cut across.

In Hamilton's System of Legal Medicine 2 cases are reported in which the anterior branch of the temporal artery was severed, permitting of a characteristic arterial hemorrhage. One was the case of the *People vs. O'Shea* tried at the Oyer and Terminer, Salem, Washington Co., N. Y. in 1881. The evidence showed that a drunken brawl had occurred between O'Shea and his wife and that the woman was found dead in her bed the morning after. She had sustained several wounds of the face and head, one cutting the anterior temporal artery on the right side. Blood-stains were found on the walls, window, and



FIG. 141.—A severe laceration of the hand closed with adhesive strips after first sterilizing the wound with iodin. (Mock, "Industrial Medicine and Surgery.")

ceiling, as well as on her person, the bed, and floor. The people claimed that the spots on the ceiling were caused by the spurting of the artery in the wound in the right temple. The defense disputed this, showing that the distance from the bed on which the woman lay to the ceiling was 4 feet, and contended that blood could not be spurted or thrown that distance. The hemorrhage was larger than would have been expected from a lacerated wound. Shortly after the trial a young man was seen who had been struck on the right temple causing a lacerated wound almost identical to that just described. The man was standing when struck and blood spurted  $3\frac{1}{4}$  feet by actual measurement. The man when first seen was standing in the same place where the assault had been committed and bleeding was still active, though the vessel was not spurting nor the hemorrhage as abundant as when the individual was first struck.

A lacerated wound on the living differs but little if any from one on the body recently dead (a few minutes). Consequently, it is often im-



possible to give a definite opinion as to the time when the wound was made. If some healing has occurred no doubt need be entertained that it was received prior to death. A wound of this character, not necessarily fatal—unless like the one referred to above, the bleeding having occurred during life—presents no definite signs by which the time of reception can be positively fixed.

**Poisoned Wounds.**—In wounds of this character a poison is introduced into the wound by the vulnerating object or force. Now it is very uncommon to encounter wounds in which the weapon has been dipped into or smeared with a poison which might convert a scratch into a fatal wound. In Indian wars before firearms were generally introduced the arrows and spears were frequently poisoned. This custom still prevails among some barbarian peoples. In some of the islands of the Philippine group the natives dip their spearheads and knives in putrid meat, infectious material thus becoming attached to the weapons, some of which is washed off by the blood and tissues when a wound is made. A wound poisoned in this way becomes infected and the tissues may slough to a greater or less extent. The wound presents no particular appearance other than that which develops as the infection progresses. There is nothing special about the wound when first received and it has no more effect at first upon the person than a like wound which is not poisoned.

**Fractures and Dislocations.**—Violence of some sort is necessary to break a bone except in cases of pathologic fracture occurring with tumors of bone or in old people, or in those due to muscular action. A fracture may be caused by a blow or a fall. When the violence is applied directly at the site of the fracture we speak of a fracture by direct violence; when the force is transmitted from some distant point we speak of a fracture by indirect violence. Either type of fracture may be the object of a judicial inquiry. Fractures due to assault are most frequently fractures by direct violence.

Fractures occur more easily in some than in others. The bones of the old are more brittle than those of the young and break more easily. In a child the bone may bend and break like a greenstick causing an incomplete fracture. Such a fracture is spoken of as a greenstick fracture. The same amount of violence applied to the bone of an adult would cause a complete fracture. The ends of long bones are united to the shaft by the epiphyseal cartilage until after puberty, up to the twenty-fifth year. The epiphysis may be separated—to all intents and purposes a fracture—but the adjacent soft parts are not injured in the way that they are when a bone is broken and the sharp ends of the fragments tear and bruise the adjacent tissues.

Fractures by muscular violence have no part in medical jurisprudence, but spontaneous or pathologic fractures may have. In such cases there is some disease of bone, such as rickets, tumor, primary or secondary, fibrous osteitis, etc., and the mere turning over in bed or suddenly moving the part may cause a fracture. Spontaneous fractures occur in locomotor ataxia, paretic dementia, and syringomyelia.

The exact cause of the changes leading to such fractures in these diseases is not known. It is claimed by some that the bones are more brittle, by others that there are no changes in the bones, but that the fracture is due to muscular violence because of the patient's inability to control and co-ordinate his movements. If a fracture is found in a dead body, supposing the break to have occurred in one of the long bones, the question as to whether it occurred before death may be determined by dissecting the affected part. More laceration of tissues and bleeding will be found if the bone was broken before than after death. The reasons for this difference have already been discussed under Wounds on the Dead Body.

The question may be asked of a medical witness how a certain fracture was produced, whether by a fall or a blow. Such a question can be easily answered if there is evidence that a weapon has been used on the part, or if there is severe bruising, laceration or cutting, and the fracture is so situated that such a vulnerating force might have been applied. If such evidence is wanting, and the contusion is the same as

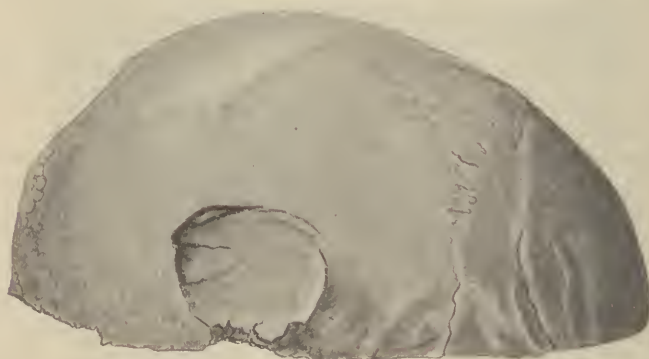


FIG. 142.—Fracture of the skull caused by the kick of a horse.

could be made by a fall, there is nothing to show that the fracture was not caused by a fall, and the answer must be made accordingly.

The meaning of fractures by direct and indirect violence has been defined, and examples of such have been drawn from fractures of long bones. The same classification holds for fractures of the ribs. These are elastic bones which bend to a considerable extent before breaking. If the force applied is greater than can be withstood, the rib breaks generally near the spine—at the angle of the rib. This is a fracture by indirect violence, the force being transmitted along the rib from the point where applied until it breaks where a sharp deflection takes place from the general line of curve. The fracture in such a case is generally outward. When a crushing force sufficient to overcome instantly the elasticity of the rib is applied the bone gives way and the fragments are usually displaced inward, frequently endangering the lung. This may happen when a man is jumped upon or injured by a force similarly applied.

Fractures of the skull are usually characterized by multiple lines of

fracture or separation of suture lines. The fragments may not be displaced, yet the fracture may be extensive and accompanied by changes threatening life. The bones of the skull, composed of an inner and outer table of hard bone and an intermediate soft portion called the *diploë*, fracture often in peculiar ways. Either one of the



FIG. 143.—Fracture of the skull caused by a blow from a long, angular bar of iron.

tables may be broken without affecting the other. Fractures associated with or following falls differ in no way from those made by blows, unless the weapon or instrument employed leaves a characteristic wound in the soft tissues or bone. The blow of a hammer causes

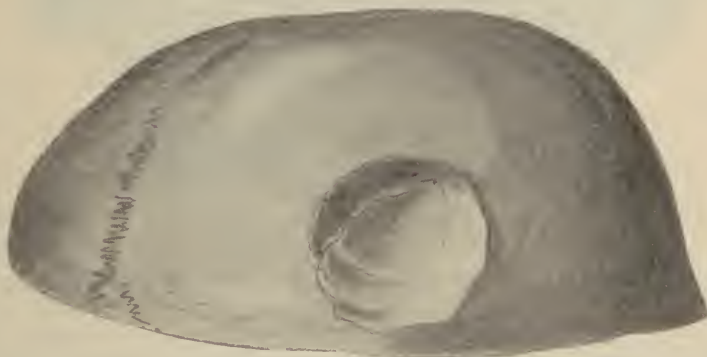


FIG. 144.—Fracture of the skull caused by a blow from a hammer. The circular form of the fracture, despite the four-cornered shape of the hammer, is accounted for by the fact that the edges and corners of the hammer were rounded from long use, and by the fact that the deceased had a thick growth of hair, and at the time of injury was wearing a cap.

depressed fracture which resembles somewhat in shape the head of the hammer. The fracture caused by a pick leaves a hole, the fractured fragment often being driven ahead of the instrument into the brain. A bullet makes a hole in the cranial bone involved and the piece of bone corresponding to the defect is not found at postmortem exam-

ination, for the bone which is hit by the bullet is frequently disintegrated.

Fractures of the sternum are rare. When the violence is great the depressed or displaced fragment may press upon the windpipe, upon the large vessels at the base of the heart, or upon the heart itself. Cases are mentioned in which a fracture of the sternum has occurred and in which the individual would have died from asphyxia if the fragment had not been quickly raised. The fracture line is usually transverse. It may be a separation of the upper from the middle portion of the sternum. The fracture may occur lower down and, while generally transverse, it may be stellate.

On the evening of July 23, 1896 two men in Albany engaged in a fight. It appeared from the evidence that the prisoner Martin struck his antagonist with a piece of scantling. The fight took place in the evening and at its conclusion the victim was unable to help himself and

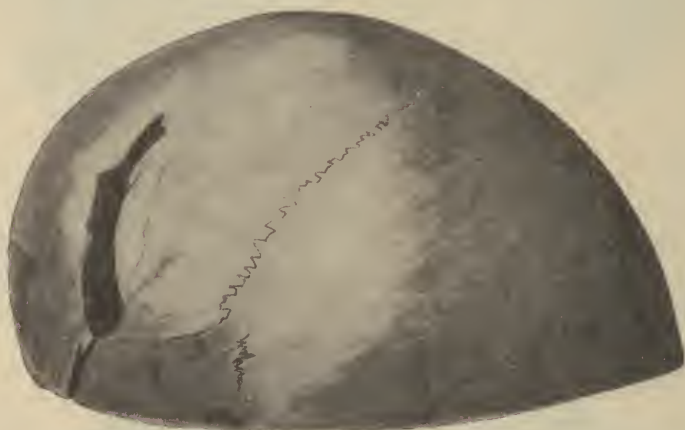


FIG. 145.—Fracture of the skull caused by the kick of a horse. On the inner surface of the skull the vitreous table is detached and the dura lacerated by a sharp splinter of bone.

died in a few minutes. Martin was tried in September, 1896. The autopsy revealed contusions more or less severe in several places. There was no fracture of the skull and no brain injury. The viscera were all considered normal. An abrasion and a contusion small in size were noticed over the sternum on a line with the fourth rib. Directly under this was a transverse fracture of the sternum or breast bone. The physician holding the autopsy stated that the heart was bruised and that there was evidence of such bruising. The envelope enclosing or covering the heart (pericardium) also showed evidence of contusion. He considered death due to paralysis of the heart caused by pressure exerted upon it by the broken sternum. The people claimed that Martin had struck a blow with the end of a scantling, the blow being in the nature of a punch, which accounted for the small ecchymosis and the depressed fracture. The prisoner was convicted of murder in the second degree.



Dislocation of bones or being "put out of joint" is not usually a fatal accident. If the vertebra or spinal bones are displaced, the lesion usually being a fracture-dislocation, the accident may be fatal. The soft tissues surrounding a joint are not so much injured in dislocations as in fractures. The end of the displaced bone is smooth and passes through the rent in the capsule of the joint which is not very vascular, and then, as it is further displaced, pushes aside without lacerating the tendons and soft tissues. As a consequence the hemorrhage is less marked than in fractures. When the bones of the spine are dislocated death may be immediate, fracture-dislocation of the atlas or paralysis may follow, the patient later recovering to a greater or less extent and being relieved of his sufferings some time after the

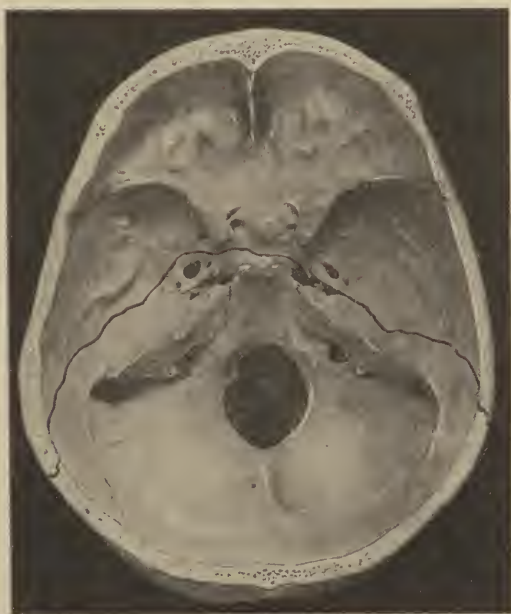


FIG. 146.—Base of skull showing typical bursting fracture passing through middle fossæ and sella turcica. (Keen's "Surgery.")

accident. Injuries of this kind are more accidental than intentional, for in an assault other methods of doing bodily harm are more frequent than an effort to cause dislocation of the vertebrae.

#### **Evidence Furnished by Wounds, Weapons, and Other Articles.**

—It has already been said that everything pertaining to a wound whatever the character should be noted carefully by the medical examiner, for he must decide by such examinations whether death was due to violence, suicide, or accident. To do this requires complete knowledge of the case, for, while considering such statements as may be furnished concerning the finding of the body or the circumstances attending death, the evidence presented by the wounds themselves is most important and may controvert the statements made in so strong

a manner as to elucidate and draw out the true story of death. The appearance of the wound answers the question as to whether a weapon was used, and if so, what kind. In order to illustrate the meaning of the above, cases will be cited and an endeavor made to draw the conclusions from the appearance of the wound and the condition of the body:

December 11, 1857, in the village of Lyons Falls, N. Y., a Mrs. Priscilla Budge, wife of the Rev. Henry Budge, who was in charge of a church there at the time, was found dead in bed, cold, and with her throat cut. A doctor was called, who cleansed the wound, stuffed it with cotton, sewed it up, and the coroner's jury, sitting the same day, gave the verdict of death by suicide. But suspicious circumstances arising, four months afterward the body was exhumed, a thorough examination made, a second inquest held, with the result that Budge was held on the charge of murder. The trial was long, most eminent counsel appeared on both sides, and acquittal was secured by the testimony of one of the medical witnesses that he thought instant paralysis of the heart would follow the severance of the pneumogastric nerves. This theory was at that day current, but later investigations in physiology have proved it false. It served, however, to render this case one in which conviction could be had only upon probabilities, and therefore the prisoner was discharged. The late Dr. John Swinburne, of Albany, N. Y., was a leading expert for the people, and from his report of the case the following quotations are taken.<sup>1</sup> The trial took place at Rome, N. Y., August and September, 1861, Judge Allen presiding.

The room in which the dead woman was found is described as being "about 8 by 10 feet, and about 8 feet high, containing a bed (French cottage), wash-stand, and chair. There was a space in front of the bed of about 3 feet, and the same at the foot. This bed was composed of a straw and a feather tick, two sheets, two French pillows and covers; also two coverlets and quilts. The long axis of the bed corresponded to the long axis of the room. The bed-clothes were undisturbed and carefully tucked in at the sides and foot, as if she were asleep, with the eyes and mouth closed firmly. The coverlets were carefully turned down on the left side to about the left breast, while on the right they were turned down about 12 inches farther, and smoothly, as if done with care. The blood flowed from the wound in the direction of its gravity, *i. e.*, directly down behind the neck, back, and head, extending laterally on the right from the neck for 2 to 4 inches, and on the left, 1 to 2 inches, running up under the back of the head and down under the right hip, and making an irregular stain on the sheet of about 20 by 27 inches. The width of the blood-stain where the neck and head lay would not exceed 9 inches in width. The back of the right shoulder and arm lay in the blood, and hence were bloody. On the left side there was little blood."

The wound is described as follows: "Position: On right side,  $3\frac{1}{2}$  inches below the lobe of ear; on the left side, about  $3\frac{1}{4}$  inches below the lobe of ear;  $4\frac{1}{2}$  inches below center of chin on median curved line, severing cricoid cartilage, esophagus, arteries, veins, pneumogastric nerves, and all the muscles of the anterior part of the neck. Circumference of neck above, or at the wound, 12 inches; curved length of cut,  $5\frac{1}{2}$  inches; depth of cut in a direct line, 2 inches back to the vertebræ cutting through the periosteum and into the osseous matter of the fifth vertebra, and also shaving off a lateral portion of the transverse process of this vertebra. Skin on right side cut down  $\frac{1}{2}$  to  $\frac{3}{4}$  inch lower than the deeper tissues. Tissues on the left side cut deeper than the skin by almost  $\frac{1}{2}$  to  $\frac{3}{4}$  inch, and extending down into the muscles external to the vertebræ, so that the skin at the termination of the cut on the left side appeared as if stretched and rounded instead of being sharp and rounded. Trachea and tissues contracted, so that the wound gaped almost 2 inches."

Other blood-stains were noticed about the body. There was a little blood on the right cheek and chin, "as if something bloody had touched them," is the way it is stated by the physician who first saw the body. The right arm was outside of the bed-clothes, palm of hand up, and some blood was noticed on the inside of the fingers, but none between them. The left hand, palm down, lay on the left breast, but no blood was seen on it. The woman was on her back, inclined slightly to the right. Partially under the right forearm was a razor, open, with a little blood on the blade. A spot of blood was on the upper sheet. No blood on the

<sup>1</sup> Transactions New York State Medical Society, 1863.

right wrist. On the pillow next to the one Mrs. Budge lay on, and on the left cheek, were stains sworn to be like the stains made by a bloody hand. On the sheet where it folded across the body was a blood-stain 10 by 14 inches long. Nowhere were any spatters of blood to be seen, as if blood had been spurted from an artery. The family physician says he stuffed the wound with cotton, sewed it up, but the blood still continued to ooze out of it.

What conclusions can be drawn from the appearance of the wound, body, and room are given in the preceding paragraphs. When the wound is examined one must inevitably conclude that considerable force was necessary to inflict such a wound. This leads at once to the question could a person and that person not very strong, lying on her back, inflict such a cut upon herself? Would the right hand be able to cut the tissues and drive the knife down to the bone and into the tissues with sufficient force to cut off a piece of bone, and could the subject after this lay down on the bed? Could such a wound be made by a razor, which is suggested by the findings? At the beginning of the wound on the left side the skin has yielded to the force of the stroke and the soft tissues were cut from  $\frac{1}{2}$  to  $\frac{3}{4}$  inch farther than the skin. Such a cut could only be made by a knife with a point, which would sink into the soft tissues, the back of the knife displacing and holding the skin, which resumed its natural position when the knife was drawn inward. Would a razor edge cut the bone and not be nicked or broken?

Both carotid arteries were cut. Was there sufficient evidence that the individual was alive when these were cut? Would there not have been more blood over the bed, head-board, walls, and floor if they had been cut during life. The bloody finger marks on pillow and face: Could the woman, after the throat had been cut in this manner, put her hand over to the pillow and rub her face? The evidence furnished by the wound and room would make the observer think, and as he thought, his knowledge of how such a wound could be made, how it would bleed, would cause questions to rise in his mind and lead him to make a further study of the conditions found. The wound would indicate that it could have been inflicted during life or upon one recently dead. The character would indicate that a strong hand and a strong knife must have done the cutting. The want of blood would indicate that the heart was not beating and that the woman was dead when the cut was made. The position of the body, the razor, the blood-stains, the bedclothes would all indicate to the practised observer that such a wound as noted in this case was not made in life and by the woman found dead. The evidence presented by the body, room, and surroundings would prove that death was not due to the severed throat, and therefore some other agent would be looked for, and the blood, which was fluid and did not stop flowing even after the doctor had stuffed cotton in the cut and had used a needle and thread, would suggest some mode or cause of death which gave such fluidity to the blood. The autopsy would decide.

In 1885 Balch was called by the District Attorney to Fort Edwards, Washington Co., N. Y., to examine a woman who had been found dead in the yard of the house where she lived. The autopsy was held



thirteen hours after death. There were several contusions on different parts of the body, the most severe being on the left temple. It appears that there had been a fight between the woman and her husband, both being drunk, and that she was knocked down by the blow on the temple, the man striking her with the butt of a revolver. After being struck she recovered consciousness and was seen staggering along the path in the yard which led to an outhouse, near which she was found next morning lying dead with face downward. None of the wounds were mortal. Until an autopsy was made the severity of the injury probably due to the contusion of the left temple could not be stated, but this showed that the most severe wound of all had not caused death. There was a sand heap where the woman fell in the yard. As no effects of the blow other than the bruise were manifest, and this had not rendered her insensible, merely confused her for a few minutes, and as sand was found plugging the nostrils and all the evidences of death from suffocation were present, it was concluded and so stated that death was not from the wounding, and the prisoner was released. The evidence of the wounds in this case was that there was some other cause of death. The only question of doubt was concerning the contusion of the pistol butt. The autopsy cleared this up and determined the cause of death.

On March 4, 1879 Mr. W. J. Hadley, a prominent lawyer of Albany, N. Y., was stabbed by a man named Hughes. There were two wounds—one on the right side, the other between the bones of the left forearm. The assault was committed in Mr. Hadley's office, and before assistance could be summoned he had lost a good deal of blood. Mr. Hadley lingered until the end of April, when he died. He was of a highly nervous temperament and the mental shock contributed to his death, as it prevented him from rendering any assistance in getting well. Infection developed in both wounds. The appearance of the wounds in the dead body indicated that they were stab wounds, but, on account of the changes which were due to the infection, nothing could be said regarding the weapon or the direction from which the blow had been delivered. Pus in the wounds indicated that they had been made some time before death, and it was also doubtful from the character of the wounds whether they were mortal. An autopsy revealed that death was caused by these wounds, as every organ was healthful with the exception of the liver, which was injured in one place, the sharp end of a fractured rib having cut through the abdominal wall in one place. Had these wounds been inflicted on a strong man and one of less nervous temperament, they would have been dangerous wounds—at least the one in the side would have been so classified—but with ordinary care I doubt if they would have proved mortal. Death was, however, in this case due to the wounds, nothing else being present which would have caused it.

A careful examination of the clothes should be made in all cases, as important evidence may be obtained. Taylor mentions a case in which a woman was found dead in the morning, and it was proved she had fallen by accident in the highway the evening before. Death was



due to a fracture of the right parietal bone—a clot having formed beneath it. The fracture was 4 inches in length. A man who frequently quarreled with the deceased lived in the house in which the body was found. A hammer with two claws was found in his room. The claws on the hammer corresponded to the two indentations over the parietal bone. At the adjourned inquest the bonnet worn by the woman at the time she fell was produced and examined, and two indentations were found in it which corresponded with those on the skull, and, of still more importance, these contained dust and dirt, rendering it more than probable that the fall in the road was the cause of the fracture. Had this piece of dress not been shown in evidence the consequences to the man who owned the hammer might have been serious.

Blood may be somewhere upon the clothes. Efforts are made to remove or cover up such stains, and consequently, unless carefully examined, the evidence of the clothing might be lost. "In the case of the Hungerford murders the poachers who were under arrest had not only washed the blood-stains off their clothes but covered them with red lead. While this increased the labor of the experts, Drs. Tidy and Major, blood was found and even the spectroscopic test was not prevented."

In the case of Latromouille, who killed a woman named Dunsback in Albany County, N. Y., in 18—, the clothes of the prisoner were sent to Balch for examination. The murderer had cut her throat and it was considered impossible that some blood should not have gotten on the clothes. All tests failed to reveal any. The man was convicted and executed, making a confession before he died in which he stated that while killing Mrs. Dunsback he had worn a long gray ulster which he had thrown away, as it was stained with blood. The ulster protected the clothes under it.

**Did the Person Move After Being Wounded?**—Wounds which are instantly mortal, which disable completely or paralyze, prevent motion after reception. But what may completely disable one person may not do the same to another. Wounds of the heart are, as a rule, supposed to render the person incapable of effort, but this supposition is not supported by facts. Dr. Woolsey quotes a case from Vibert which is remarkable: "A woman received a stab wound which penetrated the right ventricle causing a wound 1 cm. long. She did not die until twelve days later."

In November, 1870 Balch was in a hotel in Burlington, Vermont. Just after breakfast an alarm was given that a man upstairs had cut his throat. With others he went to the room. The man was still alive lying on the floor about 8 feet from the door and 4 from the window. He was lifted up, put in bed, and died that night. Near the window was a rocking chair, in front of which was a slop-pail, about the position it would be in if placed between a person's legs. Blood was in the pail, all over it, and on the carpet about it. Between where the man lay and the door was a pool of blood about the size of a saucer. Two more pools

of blood were found between his position and the window and another under where his neck had lain. All bleeding had stopped when he was found. He was still conscious. No large vessel of the neck had been divided and the hemorrhage had occurred for the most part from the cricothyroid artery. A razor was found in the pail. Blood was found upon his hands and clothes. He had intended quietly to bleed to death over the pail so as not to make any muss, but the restlessness which is associated with approaching death, the result of hemorrhage, had caused him to walk about, and he had fallen and risen until he became too weak to move.

**Position of the Body When Wounded.**—The line or direction of the wound may indicate the position the body was in when the wound was inflicted. When the different varieties of wounds were discussed the characteristics of each were given, both as regards the weapon used and the direction in which the incision was made. The character of the wound may also indicate the positions the parties occupied when the wound was inflicted. Such evidence is circumstantial and unless the characteristics are marked is suggestive rather than positive. In the case of Mrs. Budge previously noted the wound indicated that a strong knife wielded with great power had been employed, and that the wound was made from left to right, and that the person inflicting the wounds could have been in one of the following positions: behind the bedstead; leaning over to cut, the left hand holding the chin; on the bed to the right of the body, left hand engaged as before; or on the left side of the body, standing face toward the foot of the bed, the left hand again holding the head. The cut could have been made in any of these positions, for full play would have been allowed the right hand, and the line of incision, a little lower on the right than left side, where it began, would have been the natural one for a hand making such a cut.

Blood on the clothing, furniture, walls, and other articles also indicates the position of the body. In 1878 in Albany, N. Y., a man named Mallon shot and killed his wife. The weapon was an old Springfield rifle which had been carried in the Rebellion. It was loaded with buck-shot and slugs. The shooting occurred in the second story hall of the house they lived in, and blood, pieces of flesh, and bullet marks were scattered about. The majority of the wounds were in the right chest, some in the abdomen, and the right arm and forearm were severely lacerated. The defense claimed accidental discharge of the gun and that the shooting was from the front of the hall instead of the back, and the jury adopted this theory. If this were the fact, it is hard to reconcile the position of the woman with the blood marks upon the side wall and the bullet hole in the door in the front part of the hall, for the blood evidently struck the wall in a direction from rear to front. Tissue thrown upon the ceiling was demonstrated by the microscope to be voluntary muscle-fiber. This also could scarcely have reached the ceiling had the position of the body been that claimed by the defense.

Contusions may indicate in the same general way the position of

the body. A bruise on the head or on the forehead would indicate either that the body was erect or that in falling the part bruised had come in contact with the ground first. It is therefore supposable that contusions may be present which by their position would show great improbability of being self-inflicted or caused by a fall, unless in some unaccountable manner the body was placed or its parts turned, so that some projecting object could reach the particular spot. Such a bruise would indicate its causation by another weapon and might also indicate the character of the same.

The position of the body aids in determining whether the wounds were homicidal, suicidal, or accidental, for the position in which it is found may be incompatible with the one shown to be the one when the wound was received, and the conclusion is that the body was moved after it had been struck. The position of the clothes should also be noted. In 1879 a man named Thompson was found dead in a little photograph shop he kept in the village of West Troy, N. Y. He was found on his back at the foot of a narrow stairway which led from his show-room to his gallery above. The space between the stairs and the front wall was about 3 feet. Some pictures hung on the side wall of the staircase—some fair-sized photographs in comparatively heavy frames. One of these had been torn from the nail on which it hung. The nail was bent obliquely downward. The picture with unbroken glass was found between the body and the wall. An ordinary kerosene lamp with unbroken chimney was on the floor between a newel post and the body. The person who first examined the body noted carefully all the surroundings. The cause of death when the body was examined was found to be an angular wound on the left side of the head near the parietal eminence. Some blood was on the floor where the head had lain. The articles in the room were not disturbed. The clothing of the dead man was neat and it was especially noted that the trousers were straightened out and pulled down smoothly over the boots. The conclusion was drawn from the character of the wound that it was more likely made by the blow of a hammer than by a fall, unless it was made by a fall upon the corner of a step or of a newel post, but the newel post in question was round and there was no angle of the steps against which the head could have fallen. If he had fallen when part-way up the stairs, it was improbable he could have assumed the position the body was in when found, for the wound, which corresponded with the depressed fracture of the skull, was of a nature to cause immediate loss of consciousness. It appeared from the surroundings and the position of the clothes that the body had been moved after death. The coroner's jury brought in a verdict of death from an injury received in a manner unknown to the jury.

**When Two or More Wounds Are Present.**—As a general rule, multiplicity of wounds points to a homicide, although suicides do at times wound themselves in more than one place. Homicide is strongly suggested if one or more of the wounds are in a part of the body difficult for the hand of the person to inflict such a wound, and, if any of the



cuts and stabs are apparently made after death, the proof becomes almost positive that another person inflicted the wounds. In multiple wounds, each mortal, the question may arise which caused death and which was first inflicted. This is of importance when it must be determined whether death was due to murder or suicide, for suicides have been known to shoot themselves and cut their throats or take poison, any one of the methods being sufficient to cause death if only a little time is allowed.

The opinion that because there are several wounds and that they apparently could not have been caused by the deceased and, therefore, that homicide had been committed must be given with caution. Taylor reports a case where "a gentleman laboring under mania attempted to destroy himself. Besides many wounds on the forearm, neck, and face which disfigured him, there were twenty-two on the front of his chest. One of these had entered the heart, producing death after some hours by causing an effusion of blood." As said above, however, multiple wounds are generally indicative of murder.

**Suicide.**—The different methods employed in committing suicide are limited only by the extent of the imagination. When there is insanity not only does the suicide employ a peculiar method, but frequently a horrible one as well. In those not so afflicted, but determined to die, the shortest and most rapid method is considered the best. The method may be governed by circumstances suggesting it, as in the case quoted of a gentleman who cut his throat when he found his eyesight had not improved so much as expected after the removal of cataracts. He was in front of his shaving stand, the razors with which he cut his throat were at hand.

When death is due to an incised or stab wound made by the deceased certain points are noticed about blood marks upon the hands. A man using his right hand draws a knife across his throat. The hand grasps the weapon, the fingers being tightly closed. Blood is therefore more apt to be found on the outside of the hand and fingers, some between the fingers. The wrist may be bloody, but the palm and inside surface of the fingers are generally free from stains. When the contrary is the case, it suggests the use of the hand in either a struggle for life or the involuntary putting it to the part injured to protect or examine it.

The manner in which the wound is inflicted is presumptive evidence of self-infliction, but caution must be observed as in other cases, for the evidence of the wound is not positively conclusive. It may and probably does suggest suicide, but further examination discloses another's hand, and the case is homicide. When the throat is cut, suicide is the first thought, and if it is cut high up, especially if there are several cuts near to or joining the fatal one, it is still more likely that the deceased did the cutting.

Cuts of this character and in this position may be fatal even if the great vessels escape injury as the result of infection which may spread along the fascial planes or cause secondary hemorrhage. The evidence



drawn from them is that they were made with suicidal intent, for when homicide is attempted by an incised wound of the throat the wound is more apt to be not only lower but deeper, and the larger vessels are divided. Incisions may be made for the purpose of misleading the investigator, and if made after death may be caused by other instruments than those making the original wound. Not only the location of the wounds, but their other characteristics will aid in determining the intent with which the wound or wounds were made. The regularity of a wound or wounds is considered as an evidence of suicide; but while this may be indicative, it is not positive, for a murderer may make just as regular a wound on a patient incapable of resistance, asleep or drunk or unconscious from any cause, and the wound have the appearance of one self-inflicted. The case of Lord William Russell killed by his valet Courvoisier in 1840 is quoted as bearing on this subject.

Suicidal stab wounds present little if any peculiarities which will enable one to say that they were produced by the deceased. The location of the wound and its direction tell more than anything else, for, if the wound is in such a location that it could hardly be reached by the hand of the person affected, the presumption of homicide is strengthened. As a rule, suicides select the chest and abdomen for punctured wounds, but if there is mental derangement, other places may be chosen.

Suicide by drowning is frequently attempted. The autopsy, the details of which are given elsewhere, shows the cause of death, but does not show that it was suicide. Some other circumstances may lead one to draw this conclusion, such as a note left by the deceased or some action taken by the person just before the deed was committed. While serving as house-surgeon in the Brooklyn City Hospital, Brooklyn, N. Y., in 1871, Balch saw a man who had had an operation performed upon his jaw. He suffered greatly thereafter, and when told that a secondary operation was necessary, asked and obtained permission to go out and see some friends. He did not return, and shortly afterward when the tide went out his dead body was found in Gowanus Bay. This was clearly a case of suicide and death by drowning, for he had filled his pockets with stones in order to insure that his body would not float after taking the plunge.

Where there is insanity self-inflicted wounds may be very peculiar, quite extraordinary. Taylor reports some peculiar cases. "In 1850 a case occurred in Guy's Hospital, in which a person in a fit of delirium tremens tore away the whole of the abdominal muscles from the lower and forepart of the abdomen. Had the body of this person been found dead with such an unusual and serious personal injury it is not improbable that it would have been pronounced homicidal and not suicidal. A pregnant woman under delusion so ripped up the abdomen that a large wound was made, the omentum and gravid uterus protruding. A gentleman was found lying in a state of insensibility in the kitchen of his house, with a cleaver by his side. On examining the head upward

of 30 wounds were found over the back part of the skull. The man before he died stated that he had inflicted the wounds."

**Accidental Wounds.**—It may be difficult to determine whether the wound in question was caused by accident or by another person if the wound alone must be taken as evidence. Wounds caused accidentally by falls are usually on exposed parts. If, therefore, a wound of the surface of the body occurs where it could not have resulted from a fall, the natural and logical conclusion is that some human agency was instrumental in causing the injury. While we may and do have wounds which are the result of accident where persons have been engaged in a struggle, the chief class of these accidental wounds is made up of those due to a bona fide accident, such as a railroad accident, and which form the basis of civil suits for damages. There is no question in these cases of the wound being made by another agency and, therefore, if the injuries are seen shortly after their reception they are examined with the view of determining whether they were made in the manner claimed by the plaintiff.

Medical experts are expected to determine in such cases two questions: Does the injury, for example, a fracture of the leg, cause a permanent disability, and was it caused by the fall or whatever the accident might have been? There is usually not much difficulty in answering the latter question, for witnesses are generally present and cause and effect are apparent. It may be difficult to determine the first question regarding the disability. With ordinary skill and care an ordinary fracture of the leg is recovered from in about eight weeks. The patient may use crutches two months, possibly three months longer, and then a cane is used for a varying length of time, depending upon the character and determination of the patient. There may be some shortening. Even if there is, if there is no marked deformity or associated nerve or muscle injury, there is no permanent disability, for  $\frac{1}{2}$  inch of shortening will not be noticed, and any added thickness of the heel and sole will not be required to prevent limping. Tilting of the pelvis will take care of this amount of shortening and the strength and usefulness of the leg will not be impaired. A medical witness can only state these facts, for he has nothing to do with any bearing that they may have on the case.

When the injury is more serious, for example, a dislocation followed by some motor paralysis of an extremity, the prognosis must be more guarded.

The length of time that has elapsed since the injury, the efforts made to restore the limb to normal function must be taken into account; for if a nerve trunk has been injured in a dislocation or fracture and has not or but partially recovered, and months have passed since any improvement has occurred, the chances are that the injury will be permanent. It must be remembered that claimants seeking damages often make marvelous recoveries after a favorable verdict is rendered, and that while they may not intentionally they often do deceive the examiner. The greatest care should be exercised when such a case is examined.

**Regional Wounds.—Head.**—Incised wounds of the head are not, as a rule, serious. They heal rapidly and unless there is some deeper injury no further trouble need be feared. If the wound is a contused or lacerated one made either by a blow or fall, it becomes more serious. If the tissues are extensively lacerated infection may develop, giving rise to complications which may be serious.

A blow may cause an injury which is deeper than the external wound accounts for. Concussion of the brain may be associated with such a wound. The danger of brain concussion depends upon the degree. The blow may be so violent that the concussion is immediately fatal, while the external bruise is not sufficiently severe to be considered dangerous of itself. The individuality of the person enters into this discussion, for what would be almost fatal to one man will be borne with impunity by another. The blow of a prize-fighter raises a mark on the head of his opponent, equally trained and hardened. If such a blow were delivered to one not in training the person would probably be knocked unconscious or severely bruised.

A man with concussion of the brain is confused. He staggers as if drunk and talks incoherently. He may be considered drunk, for some one may have given him stimulants and the smell of liquor may be on his breath. But such a person may not be intoxicated and it is difficult to differentiate. If he dies, the autopsy is not conclusive, for nothing definite is found in concussion and the general cerebral congestion is also found when death is due to alcohol. If the person lives, the examiner can only await developments before giving a statement as to the injury and whether one exists or not. If the person dies, he must collect all data he can and after studying these render his opinion.

Whether from a blow or a fall the vulnerating force may cause more than a bruising and a concussion of the brain. The force may be sufficient to rupture a blood-vessel, leading to the formation of a clot which, by raising intracranial pressure and producing cerebral compression, causes death. One of the meningeal arteries which run within the skull between the bone and the dura is injured when an extradural hemorrhage occurs and a hematoma forms. Such a hemorrhage is most often caused by a blow or accident, and the examiner will hesitate in such a case in giving a statement that death was due to apoplexy.

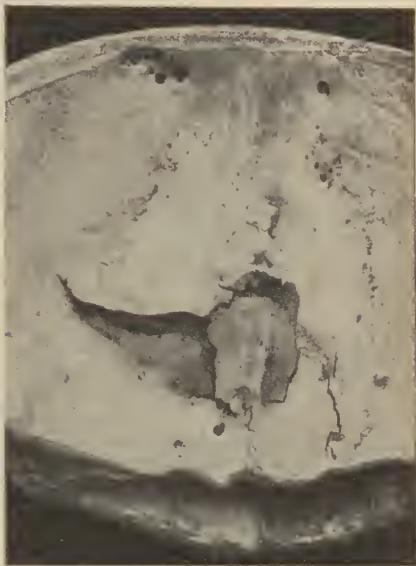


FIG. 147.—Comminuted and depressed fracture limited to inner table. (Surgeon General's Museum.)



The brain may withstand considerable pressure, especially if this develops slowly. Extradural hemorrhage with hematoma formation usually presents a fairly characteristic clinical picture. The patient is rendered unconscious by the blow, then recovers consciousness, and again becomes unconscious as intracranial pressure increases. This lucid period—the so-called latent period—during which the patient regains consciousness is characteristic. It cannot always be told how serious a brain injury will be. Edema associated with increased pressure and cellular changes within the brain may follow a blow, the first effects of which pass off, but years after symptoms of mental derangement

may intervene which are directly traceable to the injury. The clot may be in the brain proper, arising from hemorrhage due to rupture of a cerebral vessel. The question then arises as to whether the blood-clot was the result of contusion or disease. The circumstances of the case will have to be inquired into and a careful examination of the brain and blood-vessels will have to be made before an opinion can be given. In 1880 two policemen in Albany, N. Y., were called to arrest a man who was breaking the peace. He refused to submit quietly to arrest, but fought the officers on the way to the station, which was nearly a mile distant from where the arrest was made. The officers were compelled to use their clubs. He was hit but once, a fairly severe blow being delivered on the right temple which raised quite a bump, but did not break the skin. Reaching the station house he again fought, but was finally placed in a cell and left. In the evening the

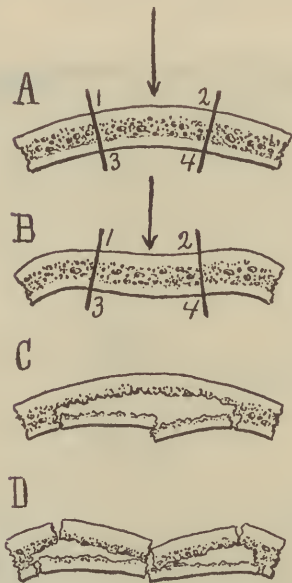


FIG. 148.—Illustrating mechanical principle of bending fractures: A and B, Arrow shows direction of impact [3 and 4 are dragged apart until tensile strength is overcome; 1 and 2 are crowded together until resistance to pressure is overcome (Teeyan)]; C showing possible effect on inner table alone; D showing possible effect on both tables. (Keen's "Surgery.")

watchman spoke to the prisoner, by whom he was cursed. At midnight he was reported asleep and snoring, but when the cell was opened in the morning the man was dead. The coroner's physician performed an autopsy and reported that he found a bruise on the right temple and a clot in the temporal muscle beneath the bruise. In the right cerebral hemisphere anteriorly was found a clot, evidently due to rupture of the right anterior cerebral artery or one of its branches. Nothing otherwise of note was found and death was reported as due to apoplexy. The coroner's physician stated that he considered the apoplexy caused by the blow struck by the policeman. The officers concerned were arrested. Their counsel, not being satisfied with the examination of the coroner's



physician, obtained an order to have the body exhumed and asked for a further examination, which was made. The first autopsy was not complete. At the second, atheroma about the aorta was found and pieces of the cerebral arteries were taken for microscopic examination. The liver and kidneys were found to be fatty. Microscopically, fatty degeneration of the vessels was clearly demonstrated. After talking the case over with the doctor who performed the first autopsy, and receiving some statements from him which did not appear in the first report, an opinion was given that apoplexy resulting from arterial disease and not the blow caused death.

Death in the case just cited was undoubtedly due to apoplexy, which is rare, however, in persons under forty years of age. Drinking or



FIG. 149.—Fissured fractures at the occipital base from bursting, not involving foramen magnum. (Warren Museum.)

alcoholism may cause arterial changes predisposing to apoplexy, for the diseased vessels may rupture as the result of increased blood-pressure from any cause. Blows, severe ones over the head, especially in persons with very thin skulls or in one suffering from cardiac or renal disease, may cause hemorrhage into the brain, but generally into the soft membranes, the arachnoid, or at the base of the brain around the medulla. Unless the force is great enough to cause rupture of the brain tissue the effusion is found somewhere on the surface and not in the substance of the brain proper. It may occur into the lateral ventricles also, but in such a case bleeding would be from the velum interpositum and might also be said to be on the surface. The case of Near, who was jumped on by Morgan, quoted previously, has a bearing on this subject. In this case there were extensive hemorrhages into the

brain substance—but the brain was not lacerated. Near was a drinking man and was drunk at the time of the assault, but it could not be said that such extensive hemorrhage was due to his habits, especially after such violence had been sustained.

In the case just cited there was but one blow on the right temple. This caused a bruising of the temporal muscle and an extravasation of blood into it. No testimony was given showing that the blow knocked the man down, rendering him unconscious. The blow made him stop for a while his fighting and struggling, which were resumed when he reached the station. The coroner's physician stated that there was no rupture of the brain substance and that the clot which caused death was in the tissue of the right cerebral hemisphere anteriorly. There was no fracture of the skull and no effusion of blood over the surface of the brain. The question arose: Was the blow on the temple one that would do injury—and dangerous injury—to an ordinary man, one not diseased? Careful examination into the character and force of the blow forced one to the conclusion that a negative answer must be given.

"If on these occasions a medical witness is unable to state positively that the hemorrhage was due to excitement or blows he will satisfy the court if he only states clearly that which is, in his own mind, the more probable cause of death; and by weighing all the circumstances of the case beforehand, he will rarely fail to find that one cause was more probable than the other. Thus if a man excited by passion and intoxication is struck on the head and the blow is slight, such as an unaffected person would probably have sustained without injury—yet in this case insensibility and death follow, and on examination a quantity of blood is found effused in the substance of the brain, can it be a matter of doubt, medically speaking, that the effusion was chiefly due to the excitement under which the deceased was laboring? To take a converse instance: A man engaged in a personal conflict with another is struck most violently on the head or falls with great force on this part of his body; on inspection it is found that death has arisen from effusion of blood on the surface of the brain, and it would be no unexpected consequence of the violence inflicted that a similar appearance should be met with in an individual calm and unexcited. Could a practitioner hesitate to say under these circumstances that the blow would satisfactorily account for the effusion without reference to any coexisting causes of excitement? These may be allowed to have their influence in giving an increased tendency to cerebral hemorrhage or in aggravating the consequences of the blow, but no further" (Taylor).

A blow may be delivered upon the head, and the patient die as the result of hemorrhage some time after. Taylor reports a case where a man was knocked down and struck his head violently on the ground. He was stunned and staggered when he walked. From the time of his accident, April 11, 1853, up to the 12th of June he suffered more or less pain in the head, but attended to his business. On the latter date he became insane and was taken to a hospital. He recovered so far that he was about to be discharged when the symptoms returned and he

died on August 17th, four months after receiving the injury. The autopsy revealed a clot embedded in the frontal bone, a large and old clot in the arachnoid. This covered the entire surface of the left hemisphere and had evidently been there for some time, as it was organized. Another clot was found in the pons Varolii. The assailant was held for the death and convicted of manslaughter.

The date at which the hemorrhage occurred may be conjectured by the appearance of the clot. If recent, it is red in color and has the appearance of fresh coagula. After some days the color changes to a brownish tinge, which, in turn, if the patient lives, becomes yellowish, anywhere from twelve to twenty-five days after its appearance. The brain surface upon which the clot rests has become depressed by it, the depression equaling it in size and resembling it in shape. The clot as it becomes old becomes much firmer, becomes organized, and attached to the membranes and the brain. In giving an opinion as to the date of effusion the medical witness must use caution. He can only state what is most probable, based upon his experience in such cases. Death may be due to a blood-clot and there may be evidence that a week or so before death the man had been assaulted, and that three weeks before death he had suffered a severe fall, striking on his head. The question is asked the medical witness whether the clot, which he states is an old one, was due to assault or the fall, and his answer must depend on the examination of the clot, and even then he cannot always be positive.

**Face.**—Wounds of this region usually heal readily because of the vascularity. They are, however, frequently associated with deformity which becomes a question for the medical expert, especially in civil suits. A wound of the cheek, for example, a cut, will amount to but little, as it heals rapidly, but if it divides Stensen's duct, which conveys the saliva from the parotid gland to the mouth, trouble may be experienced, for a fistula will form which may be closed with difficulty. If a blow is struck causing laceration of the soft tissues as well as fracture of the bones, unless the fracture be confined to the lower jaw, deformity is sure to follow.

If the injury affects the nose, the bridge of which is driven in, a deformity is very apt to follow. It may be easy enough to raise the depressed fragments, but difficult to keep them in place after they are raised. The appearance of a patient may be changed, for a nose that was aquiline or straight becomes sunken and changes to one that is commonly called "pug." These fractures do not always cause a deformity, for unless the bones forming the septum of the nose are crushed the nasal bones do not fall in, and as they unite rapidly but little if any deformity results. If the wound is caused by some hard substance which is forced into the nose the result may be fatal, as the plate of bone, the perforated or cribriform plate of the ethmoid, which forms the roof of the nasal cavity, is very thin and offers but little resistance to the passage of a weapon or instrument into the brain. In this way a fatal injury may be done that organ.

Wounds that cut or lacerate the tissues about the eyebrow are



sometimes followed by chronic neuralgia. The supra-orbital nerve may become involved in the wound, and even if not injured by the instrument causing the wound may be pressed upon by the scar which develops and so give rise to constant pain.

If the orbit is involved the wound is not only severe, but oftentimes dangerous. Like those of the roof of the nose, the bones forming the inner wall of the orbit are very thin, and punctured wounds of this region in which death has resulted from the brain being injured are not rare. Taylor mentions a case where death took place after the end of a common broom had been thrust into the face of a boy. The orbital plate was found punctured and an abscess of the brain had developed. Wounds of this character when they go no further than the orbit itself may either destroy or impair sight.

**Neck.**—Wounds of the neck are usually suicidal and incised. The question as to whether such wounds are suicidal or homicidal, with the characteristics of each, has already been discussed. When death does not result early from such a wound, it may prove fatal as a result of complications. If healing takes place, the resulting deformity is not so serious as in wounds of the face, but severe and distressing scars are sometimes found where there has been considerable loss of substance following suppuration. The after-results may be serious, for the general health may be impaired and nerves cut, which if not repaired will be followed by paralysis more or less marked. If the windpipe or gullet is divided the cicatricial contraction which follows may seriously interfere with breathing and swallowing, the general health being thus affected.

When a stab-wound is made the severity of the wound depends upon the location and the depth to which the weapon is sunk. These wounds are generally homicidal. As the one attacked, unless asleep, intoxicated, or unconscious, is apt to turn or move, and the wound instead of being deep and possibly fatal is superficial. If the weapon is well directed and considerable force applied, death may be instantaneous or practically so, for the point of the blade may divide not only the vessels, but may pass between the vertebræ, injuring the cord. If the cord is injured the person attacked falls, for, if not dead, he is paralyzed as a result of injury or division of the cord. If the weapon severs the cord above the third cervical vertebra death may be instantaneous.

If the wound is a severe contusion the effect may be fatal, for blood may be extravasated about the cord, as in the case of Near referred to above. Hemorrhages into the membranes of the cord are rarely due to disease and, when present, violence of some sort is to be suspected. Injuries about the neck may cause later troubles with the cord. Paralysis of one or both upper extremities may follow injuries of the cord—a hemiplegia may follow.

**Spine.**—Wounds of the spine are more commonly the cause of civil suits for damages than of criminal cases. A fall or blow causing concussion of the cord may cause a more or less marked paralysis of the



lower part of the body, the bladder, rectum, and lower extremities being affected. Such symptoms or disabilities may follow railroad accidents. The term "railroad spine" is applied to some of these injuries. Contusions received in railroad accidents do undoubtedly cause in some instances injury to the cord and in some instances are followed by softening and permanent paralysis—even death. The symptoms in many such cases are undoubtedly feigned and a most careful and exacting examination must be made to determine whether or not a real injury exists.

A fracture-dislocation of the spine may be fatal either as the result of laceration of or pressure upon the cord. Death is to be expected most frequently in high injuries involving the cervical cord, and the higher the injury, the more rapidly death ensues. If dislocation of the odontoid process of the second cervical vertebra occurs, as a result of rupture by accident or destruction by disease, death may occur instantaneously, for vital centers in the cord may be destroyed. A case is mentioned by Holden in which a lady carrying a child on her shoulders suddenly fell dead when her head was thrown backward by the child when she slipped. In children the ligaments confining the odontoid process are not so strong and such accidents are more apt to occur.

The spinal cord, like the brain, tolerates pressure and recovers fairly well from damage done it. Fracture-dislocations of the spine are usually caused by acute hyperflexion. If dislocation of the vertebra is far enough forward to crush the cord, recovery does not occur. Contusions of the cord in which immediate paralysis occurs have been observed in fracture-dislocations. In such cases, without crushing, practically complete recovery from the paralysis may occur.

Dr. W. G. MacDonald of Albany, N. Y., cites the following interesting case: H. B., aged twenty-eight years, was admitted to the hospital April 29, 1895. The afternoon of the day he was admitted he had been thrown from his wagon when the horses ran away. He struck on his back. Whether a wheel passed over his body could not be determined. He was not rendered unconscious by the fall and made an effort to get up, but he could not, as there was no power in the lower limbs. A physician was called. He found a depression of the spinous process of the tenth dorsal vertebra, crepitus at that point, and paraplegia. The patient was taken to the hospital at once and, the diagnosis being confirmed, an operation was performed to relieve the pressure on the cord. An incision 6 inches long was made over the seat of the injury and the compression of the cord relieved. In November, 1896 the patient was walking with a cane, function of the bladder was nearly restored. There was no cystitis and the man could drive about in a wagon and tend to business.

As stated above, a crushed cord never regenerates. In injuries lower down in the spine, when the cauda equina is involved, recovery may occur even after severe injuries, for the nerves composing it have, like peripheral nerves, neurilemmal sheaths which play such an important rôle in nerve regeneration. Without these sheaths, which form

the protoplasmic bands along which neurofibrillæ course in the process of regeneration, regeneration of a nerve does not occur.

**Chest.**—The gravity of a wound of the chest depends upon whether or not the chest cavity is entered. A wound entering the cavity may involve the heart, the great vessels at the base of the heart, or the lungs. Anyone of these are usually fatal wounds. Persons do not necessarily immediately die from wounds of the heart and a stab is not necessarily instantly disabling or instantly fatal. Taylor reports a case where a man ran 18 yards before he fell, after having received a punctured wound of the right ventricle which entered in an obliquely transverse direction, dividing the coronary artery. The patient died six hours after the wound was received. Wounds of the heart are considered fatal and, although an occasional case of punctured wound from which the patient recovered is reported, generally such wounds are mortal.

Rupture of the heart occurs from natural causes and assaults. When due to disease the left ventricle usually gives way, death occurring rapidly. The following case illustrates the above: A large fleshy man was found lying dead on the floor of his bedroom. He had fallen, while dressing, in what was called a fit. He had just come from his dressing room, when he turned to his wife and put his hand over his heart, reeled, and fell on the floor, saying "I feel so queer." He died in less than five minutes after he had spoken. A postmortem examination revealed a rupture of the left ventricle which extended from its base to nearly the apex. The heart was fatty. Such a case as this, if it had occurred after a struggle, would have raised a question as to immediate cause of death unless a careful examination had been made of the condition of the heart walls.

When rupture is due to violence it may occur in any of the cavities, and the right ventricle is found lacerated as often as the left. No external evidence of an injury, such as bruising of the skin, may be found, yet the person may rapidly die from the effects of the injury such as that caused by a wagon passing over the chest or a heavy weight falling on it. The above statement is illustrated by the following: A young man was run over by a heavy wagon, two of the wheels passing over the chest. He got up, apparently uninjured, walked to the sidewalk, and fell dead. The heart was found ruptured when a postmortem examination was made.

Heavy blows upon the chest may cause death from injury to the heart and lungs. A blow on the chest may, even without fracture, cause death by inhibiting the heart's action, and on examination no definite marks of a contusion may be found. If the sternum is fractured and one of the fragments is depressed death may occur as the result of pressure upon the heart or large vessels. Usually a fracture is of no especial significance unless the fragment is driven in, when it becomes of considerable importance.

When a single or many ribs are broken, they break usually at one of two places. Either at the point where the force is applied or at the angle, the force traveling along the rib. If a fracture occurs in the

latter position usually a compressing force is applied. The chest is squeezed and the fragments are displaced outward. When the break or fracture is caused by a quick forcible blow directly applied the fragments are more apt to be driven inward and, if the lung is injured by a sharp fragment of bone, the bone injury becomes of secondary importance. If the fragments even when displaced inward do not enter the pleural cavity the wound is no more dangerous than when the displacement is outward unless they press against the tissue causing destruction of these secondarily. Ribs unite rapidly after fracture. An empyema may develop as the result of the penetration of infected material into the pleural cavity. The chief danger is from wounding the lung. While the wound may not be extensive or sufficient to cause danger from bleeding, it may be large enough to permit of the escape of air into the tissues, which, if the tear is not caused by a local inflammatory process, may spread and become almost universal. Such an emphysema may cause death.

If the lung is injured death may be caused by hemorrhage. This natural bleeding may progress rather slowly and death may occur before the gravity of the lesion is recognized.

**Diaphragm.**—Wounds of the diaphragm are apt to involve either the pleural or peritoneal cavities, or both. The diaphragm may, however, be involved alone as the result of a fall or blow. Taylor reports an interesting case: "A man fell from a height of 20 feet. He had fractured both arms and sustained other severe injuries; on the day after admission to the hospital he complained of a definite pain on the left side. He survived almost thirteen weeks. On inspection the diaphragm was found lacerated in two places, in one to the extent of 1 inch and in the other to the extent of 6 inches." He also reports another case living nine months after the accident which produced the rupture, one so large that the stomach and colon occupied the left side of the chest.

There was no doubt that the tear was an old one, for its edges were healed. Had it not been for an injury to the ankle this man could have walked. The question of locomotion after rupture of the muscle is of medicolegal interest, for an assault having been committed, the assailed walked after it and then died from what was shown to be a wound or wounds of the diaphragm. The question arises whether the rupture was due to assault or some other cause. Certain allowances for the endurance and muscular power of the injured person must be made and the circumstances under which the injury was received. In one man a rupture of the diaphragm by assault would cause him to fall, while in another it would have no such effect. The fact is that such wounds, while highly dangerous, are not disabling when received.

**Abdomen.**—Wounds of the abdomen are divided into those involving the abdominal wall and those penetrating or entering the abdominal cavity. Injury of the abdominal viscera may occur with or without a solution of continuity of the abdominal wall.

A simple incised wound of the abdominal wall is dangerous only



because of its extent or hemorrhage from some large vessel. It has the same consequences as incised wounds of the breast, chest wall, or extremities. The nearer the wound approaches the peritoneal cavity, the greater the danger. Care must be exercised in the deep wounds not to exert excessive pressure from within upon the healing tissues, for a hernia or rupture may develop as the result of stretching of the young scar tissue. Mention is made of this for in civil suit for damages contributory negligence on the part of the plaintiff might be claimed in case such a hernia developed. The surgeon attending such a case should protect himself from the charge of neglect or want of knowledge or care and see to it that his orders to the patient are carefully understood not only by him, but by his family. If the surgeon has exercised every precaution and the patient has followed carefully his instructions, but only partial union has taken place, neither he nor the patient can be held responsible. Suppuration of the wound gives an additional gravity to the assault. A wound will not always heal in the way hoped for and expected. This may be unavoidable, neither the surgeon nor attendants being to blame. Lacerated are more susceptible to infection than incised wounds, but at the present time lacerated wounds are frequently transformed into what are practically incised ones, and healing without suppuration occurs.

The abdomen is opened now without dread of infection. The surgeon is often confronted with the question, when the abdomen is injured, whether or not to open the abdominal cavity. To open it when there is no definite indication is not warranted. In some cases it is questionable whether the cavity has been entered by the weapon used, but in cases in which there is a strong probability that the cavity has been entered and a probability that viscera have been injured or intestines opened the abdomen should be opened. Cases are not infrequently reported in which a knife, dagger, or some other weapon has entered the abdomen and probably injured the intestines without causing peritonitis and death. These cases are, however, relatively rare. With modern surgical technic the abdomen may be opened with safety. As stated above, the abdomen should be opened in those cases in which visceral injury or intestinal perforation is suspected.

If the operation is performed and the patient dies from shock, loss of blood, or sepsis, the question will be raised by the defense that but for interference of the surgeon the man would either not have died or would not have died so soon, and that death was hastened by surgical intervention. Such is not an intelligent line of defense. The autopsy will reveal whether or not the wound would have been fatal and that without surgical intervention nothing could have saved life. The only chance, if there was one, was early and intelligent surgical intervention. It makes no difference if the man did die somewhat earlier because of the operation. The autopsy showed that recovery was impossible and that the wounds themselves would have proved fatal. The surgeon would err in not operating when there was a possibility of saving life. He would render himself liable if he did not do so and enable the lawyer



to say that the man might have lived if only some doctor who knew his business had been called.

Contusions of the abdominal wall are not as in other locations followed by ecchymosis unless very severe. They do, however, cause considerable trouble and may prove fatal immediately or subsequently because of inflammation. If the blow lands on the "pit of the stomach" over the large sympathetic plexuses death may occur from sudden cessation of the circulation and respiration. A postmortem would reveal nothing as to the cause of such a sudden death. Should the blow be in some other part and death be caused by peritonitis, death usually takes place four or five days after the assault. The victim may show no apparent injury after subcutaneous rupture of the intestines, rising and walking after the blow has been struck, but in twenty-four hours peritonitis begins and death occurs. All cases in which peritonitis is caused by subcutaneous injuries do not terminate fatally, but the danger of such an ending should be known, so that the responsibility for it may be properly placed.

Contusions may result in very serious lesions. The force of a blow transmitted through the abdominal walls may expend itself upon one or more organs contained in the cavity. Rupture of the liver, spleen, stomach, kidneys, and intestines may be caused in this way. All of these are dangerous injuries which may prove fatal. The question as to whether a laparotomy is to be performed depends upon the symptoms which develop. If there is a suspicion of injury of any of the viscera which may prove dangerous as a result of hemorrhage or infection an exploratory operation should be performed. If operated upon early hemorrhage from a ruptured liver may be controlled and the liver heals readily when the torn or cut surfaces are united. The results naturally depend upon the size of the cut or rent and the associated injuries.

The kidney may be ruptured as the result of subcutaneous injury. Such injuries are frequently accompanied or followed by blood in the urine. The kidney may be so much damaged, the pedicle being torn, that removal becomes necessary.

**Fracture of the Bones of the Pelvis and Injury of Pelvic Contents.**—Fracture of the bones of the pelvis is not so common. Such fractures are usually caused by some heavy crushing force. The head of the femur may be driven through the acetabulum into the pelvis as the result of a fall upon the feet.

Rupture of the bladder may be caused by a blow upon the abdomen. Subcutaneous rupture is especially apt to occur when the bladder is full. It may be torn or ruptured when the pelvis is fractured, a sharp fragment of bone entering the viscus. In the cases of subcutaneous rupture the tear in the bladder occurs most frequently in the posterior superior wall, and the urine that is extravasated passes directly into the peritoneal cavity. In those cases in which the rupture is extraperitoneal the urine is extravasated into the cellular tissues surrounding the bladder anteriorly and the prognosis is not so bad as when the urine passes into the peritoneal cavity.

Wounds of the bladder are not immediately disabling. A person with a ruptured bladder may walk a considerable distance and may live some time. Lewis has observed a patient who survived a rupture of the bladder for ten days, finally dying of peritonitis. Rupture of the bladder is associated with pain, abdominal tenderness and rigidity of the abdominal muscles, inability to void urine, and the passage of blood. If boric acid solution or sterile water is injected into the bladder less than injected comes out. This is sometimes misleading, for the catheter may pass through the rent in the bladder into the peritoneal cavity and the same amount be regained as injected. The bladder cannot be distended when injected. If surgery is practised early many subjects with a ruptured bladder may be saved, for the rent in the bladder can be sutured. In the extraperitoneal ruptures the chances of recovery are greater than in intraperitoneal ruptures, but even in the former there is the possibility of death from sepsis.

When rupture occurs from disease of the bladder wall due to tuberculosis, syphilis, carcinoma, or some similar condition no external violence need be applied. The bladder may rupture as the result of distention in such cases. Some movement, such as sudden turning or stooping, might give the additional pressure necessary to cause the tear. This might be of importance if a man were held for causing the death of another by rupture of the bladder, for the accused might not have touched the deceased, merely having made a threatening gesture which the other dodged, the quick movement of escape being the real cause of rupture of the diseased and distended bladder. There are naturally no external marks of violence in such cases. An autopsy would show the abnormal condition of the bladder walls and distinguish a rupture by violence from one due to disease, except in case a diseased bladder were struck, in which case the examination might not be conclusive. Generally the bladder when diseased gives way at the point most weakened by the lesion.

The bladder may rupture spontaneously from overdistention without being diseased, but in such a case there is usually some obstruction, such as a stricture or enlarged prostate, which prevents free emptying of the bladder.

A stab wound of the bladder may cause such a small opening that but little if any urine escapes, and recovery takes place, the wound closing of itself. This is, however, unusual. If the wound be large the same danger exists as in rupture of the bladder.

Wounds of the rectum occur mostly as the result of surgical operations and rarely become the subject of medicolegal inquiry. Fissures caused by pederasty, while technically wounds, hardly come within the province of this article. If insanity exists there may be rectal wounds, but in such cases the circumstances and history will determine as to how the injuries were inflicted.

**Genital Organs.**—Wounds of the male genitalia are the result, as a rule, of kicks or blows with a stick and are more apt to be accidental than intentional. While such an injury may be a severe one, it is not

dangerous unless the urethra is torn and urinary infiltration occurs. Lunatics may mutilate themselves and the mutilation prove fatal from hemorrhage, but such cases will be determined as to the manner in which the mutilation was done by examination of the circumstances and general evidence. Such wounds are rarely matters of legal investigation.

Wounds of the female genitalia are more frequently brought to the attention of the prosecuting officer, for criminal assaults in which injury is done these parts are not infrequent. A wound in this region is dangerous according to its severity. A kick or blow will lacerate the soft parts, the cut being made by the bone, as described in discussing blows on the head. Hemorrhage may prove fatal. These contused lacerated wounds of the vulva present a clean-cut appearance as if incised. Careful examination will reveal the difference. If incised wounds are found, especially if they extend within the vagina, they are positive evidence of malicious assault.

Accidental wounds by a penetrating weapon may lead to erroneous conclusions and statements, as they are similar in appearance to those produced by wilful violence. Taylor recites the following case: "A girl, aged six, fell from a tree with her legs apart upon one of the sharp-pointed shoots below. This entered the vagina and, passing through the posterior wall, broke off. A woman removed the wood with some difficulty. The child died in twenty-four hours of peritonitis. Had the child been found dead with the wood in her body there might have been some difficulty in assigning an accidental origin to such an injury.

**Wounds of the Extremities.**—These are of all kinds. Fractures and dislocations cause considerable disability, but injuries of the tendons and nerves cause, unless corrected, the most lasting disabilities. Incised and lacerated wounds are dangerous, depending upon their location. If a large vessel is cut, death may occur from hemorrhage. If a nerve is cut and not repaired, paralysis of the muscles supplied by it will follow. An incised wound on the anterior surface of the forearm, near the wrist, if deep is serious, for the tendons of the hand may be divided, causing serious disability. If the tendons are divided they retract and it may be difficult to suture them. If they cannot be sutured the use of the hand will be impaired. Even if united the various tendons may be more or less matted together by an inflammatory process and impairment of the function of the hand occur.

Injuries of the blood-vessels may occur as the result of punctured wounds, may be followed by the development of an aneurysm, or if vein and artery lying close together are both injured, by an arteriovenous aneurysm.

Dislocation of the different joints are usually easily recognized and reduced. If not recognized most dislocations become irreducible after a short while, and then muscular atrophy develops. The limitation of motion occurring in these old dislocations causes marked disability.

Fractures of the long bones, especially if the break occurs near or involves a joint, are apt to be followed by deformity and considerable disability. These may be due to the development of callus in or about



the joint or to faulty position of the fragment when union occurs. In compound fractures infection may develop which may cause extensive sloughing of the soft tissues and death. A medical witness may be asked to say whether a given fracture is the result of a fall or of a blow, or if a blow, whether a weapon was used. The condition of the injury and its extent will usually give the answer. In a civil suit the question may be put, Will deformity or disabilities arise from this fracture in the future? An answer cannot always be easily given. Associated injuries to the joints, nerves, muscles, or blood-vessels may so complicate things that a definite answer cannot be given, but in most cases the amount of disability and the length of the same can be stated with a fair degree of certainty.

# GUNSHOT WOUNDS; BURNS AND SCALDS

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## GUNSHOT WOUNDS

WOUNDS may be caused by explosives used in a number of different ways. Injuries, accidental, criminal, and suicidal, have been caused by explosives used in hollow castings, in gas pipe, in large kegs with hollow ends, in bombs, and in almost any implement which, being hollow, permits of the use of the explosive form of powder or dynamite to cause injury or death. The ordinary firearms—revolver, rifle, and sawed-off shotgun—are the ones most usually employed with criminal intent.

Nitro powders are largely employed today in shotguns and rifles, being known as smokeless powder. Black powder is still extensively employed in cartridges used in pistols and revolvers, with which most of the wounds coming to the medical examiner are inflicted. In the BB cap a mixture of fulminate of mercury and potassium chlorate is used. Black powder is an explosive mixture and burns with great rapidity, developing about 280 times its volume of gases, consisting chiefly of CO and CO<sub>2</sub>. Black powder coming in contact with the skin or other tissues stains them, as it leaves on burning or exploding a carbonaceous residue. The nitro powder residue is much less in amount and lighter in color. The nitro powders have usually as a foundation guncotton or some form of nitrocellulose, picric acid or some picrate, or ammonium nitrate. These powders explode rapidly and violently, causing a much greater strain upon the gun barrels than black powder, and are more effective in short barrels.

The effects of a missile fired from a firearm depend largely upon its velocity. The speed and force of impact of a bullet decreases from the instant it clears the muzzle, the decrease being almost entirely due to the resistance of the air. The velocity and penetration of the missile are increased by the use of a powder in proper amount, grain, and quality. The powder should burn thoroughly before the missile leaves the barrel. A powder of too fine a grain explodes or burns, endangering the weapon; while, when powders of too coarse a grain are used, a considerable part of it may be blown out of the barrel unburned, thus decreasing considerably the potential energy of the explosive. An increased length of barrel, up to the point where friction counterbalances the advantage of complete combustion, permits of the fuller effect of the expansive power of the gases caused by the explosion.

A barrel measuring 26 inches in length is most advantageous in shotguns and rifles when black powder is employed, although 14 feet would

be required for burning all the grains. A shorter barrel suffices for nitro powder, although a long barrel increases the penetration and distance the missile or missiles are carried. Missiles develop greater velocity and force when fired from a rifle than from a revolver, although all the conditions except the length of barrel may remain the same.

Close confinement of the gases behind the missile increases the efficiency of the firearm. Well-made firearms in which the cartridge fits the barrel closely are better than the cheaper ones, and the efficiency may be still further increased by proper loading and wadding and by the hollowed expansile base of the bullet by which the "windage" is counteracted.

Velocity and penetration are largely influenced by the shape and weight of the missile. Although a lighter bullet may travel faster, it strikes with less force than a heavier one, for the force of the impact is the resultant of the velocity multiplied by the weight. A heavy missile, especially if long and pointed, may pass a lighter one, especially if the latter is round, even though the latter has started with greater speed, for the resistance of the air has less effect in checking its flight. Such a missile will have greater penetration at a given range because of its greater weight unless the speed of the lighter missile more than compensates for this advantage, the penetration being, other things being equal, approximately as the square of the velocity.

When a weapon is poorly made and not clean, penetration of the missile may be reduced by the bullet turning and striking sidewise. This may occur at as short a distance as 6 inches from the muzzle. In firing seven shots from a cheap .22-caliber revolver with fairly clean barrel and at distances varying from 8 to 24 inches one observer noted that but one bullet struck by the point, while one actually struck by the base. The uninitiated, especially ignorant criminals, frequently choose a weapon of large caliber, of poor material and workmanship, with a short barrel and loose joints. A case has been mentioned in which a heavy overcoat stopped three out of six bullets at distances of from 5 to 10 feet in an attempted homicide. Missiles fired from such firearms frequently strike sidewise and, because of the low velocity and turning, take a very erratic course. Bullets may become stuck in the fouled barrel of a pistol, the loose joints of the weapon permitting the escape of gas, which prevents bursting of the gun.

**Deflection of Bullets.**—A bullet may be deflected by striking some hard object and being turned out of its course. It usually strikes the object with a glancing impact. Sometimes missiles have been known, due to a defect in structure, to split into fragments causing multiple wounds. Dirt, especially in the muzzle, destroys all accuracy in shooting, this is especially true of rifles. A bullet fired from a dirty weapon may strike sideways after traveling but a short distance. Deflection seems to be dependent to a considerable extent upon low velocity. The round bullet or ball is more easily deflected than the long slender one, especially if the "windage" has been great.

Bullets fired from revolvers are usually soft and may be deflected



by almost any tissue of the body. They often flatten when striking bone and are changed in their course. Bullets of soft lead, even with great penetrating power, may split upon striking bone or become flattened, resembling in shape a mushroom, the point becoming several times greater in diameter than the base. Fragments which are separated from such a bullet may injure tissues at some distance from the point of entrance and may make multiple slit-like wounds of exit.

The steel-jacket bullet, used in the modern sporting and military rifle, when in full flight is not usually deflected from its path by any of the tissues of the body. They either penetrate or perforate the body, but, because of the velocity, they may cause marked comminution or splintering of bone when they strike it. Round bullets or missiles travel-



FIG. 150.—1, Krag-Jorgensen bullet; 2, new Springfield bullet (pointed). (DaCosta, "Modern Surgery.")

ing at low velocity may penetrate a bone and come to rest in the medullary cavity. Lewis has removed shrapnel from the medullary cavity of the femur. The round ball had perforated the cortex of the femur and entered the marrow in which it lay. Several small linear fractures radiated from the hole made by the missile in the cortex. Soft-nosed and explosive bullets and bullets partially dismantled which were used with the intent that they should become deformed when striking tissues are used much less frequently than formerly.

The bullets used in cartridges vary in weight from 25 grains to nearly 2 ounces. The bullet used in modern rifle cartridges has the advantage of the screw and wedge, as well as of greater weight, and traveling with greater velocity has a straighter course than the old soft lead round bullet fired from the smooth bore rifle. Some cartridges have a wad

between the bullet and powder. Almost all rifle and revolver cartridges, with the exception of those of small caliber, such as the .22, have a center fire. Some ammunition is lubricated, some is loaded with black, some with nitro, powder. When a gunshot wound is being investigated the variety of cartridge used in the case must be carefully investigated.

**Character of Gunshot Wounds.**—The character of gunshot wounds varies depending upon the character of the bullet, the velocity at which it travels, and upon whether or not bone is struck, which may be comminuted, causing secondary injuries of the tissues, and upon whether the missile is deflected. A steel-jacketed bullet traveling at high velocity may perforate the body or the soft part of the extremity causing but a small wound of exit. The wound of exit is usually larger than the wound of entrance, its edges may be torn, and the wound gives



FIG. 151.—Showing a large "explosive" wound of exit resulting from a rifle ball, causing the entire loss of the middle third of the ulna. (Fauntleroy.)

more evidence of the explosive force of the missile than does the wound of entrance. A soft nosed bullet or a steel-jacketed bullet traveling at low speed causes a wound which has the essential characteristics of a contused one. The wound of entrance will be surrounded by discolored tissues. It was thought at one time that the tissues about a gunshot wound were burned by the heat of the bullet. A rifle ball stopped by a sand-bank may be held in the hand two seconds after it leaves the gun without causing discomfort. This proves that the bullet could not have become very warm during its flight. The old statement made by Bergmann that gunshot wounds sustained in war are aseptic at time of infliction must be modified as a result of the experience of the late war. The liability to infection depends to a great extent upon the

bacteriology of the soil over which the opposing armies are fighting and upon the damage done soft tissues by the missiles used. Penetrating wounds caused by steel-jacketed bullets in the late war usually healed without infection. Gas gangrene was, however, observed in some, for pieces of clothing containing the gas-producing organisms found in the fertilized soil of Belgium and Northern France were introduced into tissues, especially muscle, which had been devitalized by the missile. Wounds caused by high explosives were especially susceptible to infections by gas organisms, for the muscles which were torn, chewed, and devitalized by the irregular, rough, sharp fragments of shells formed an excellent culture-medium for these gas-producing organisms.

The infections observed in war are due, as a rule—and this applies to gunshot wounds in civil life—to organisms carried into the wound tract on pieces of clothing or from the surface of the body.

The wound of entrance is usually easily determined. The edges of the wound of exit are usually somewhat everted, subcutaneous fat protruding. If the bullet has been deformed by striking a hard object the tissues about the wound of exit may be extensively torn. Multiple wounds may be caused by a bullet splitting. The small fragments produce multiple slit-like wounds of exit.

**Shotgun.**—The load of a shotgun may consist of balls, fine or coarse shot, pebbles, nuts, slugs, or other missiles. Unless ball is used a shotgun will not be effective beyond 100 yards, although stray shot at times kills beyond this distance. The gauges of gunshots commonly used are 10, 12, 16, and 20. Guns shoot more or less closely according to the degree of “choke” or its absence. At a distance of from 1 to 2 feet, depending upon the weapon and the character of its load, the charge enters with but a single point of entrance, not commonly so absolutely round as in the cases in which a ball is used. As the distance increases the wound becomes more ragged and separate shot-holes can be seen around the border of the wound. The penetrating force is increased by the entrance of the load in one mass. A single pellet of shot may strike the body and cause death. Great care should be exercised in making an examination not to overlook such a wound. Some cartridges are loaded so that the shot will spread widely shortly after leaving the muzzle, while others are loaded so that the shot will hold together for a long time.

Careful examination rarely leaves any doubt as to which is the wound of entrance and the wound of exit in wounds made either by pellets of shot or bullets fired from the heaviest sporting rifles. The points about to be mentioned are of more importance than the one regarding the size of the orifice.

The edges of the wound of entrance are commonly blackened by dirt adhering to the bullet or by lead from the bullet itself. This blackening of the edges is less frequently noted when nitro powders are used. The lead mark is most frequently seen upon the bones. Correspondence of holes in clothing with the wounds, and the carrying of fragments into the orifice, burning of the clothing or marking by powder



grains, marking of person or clothing by wadding or by flame or powder grains, the finding of the ball in the body, the direction in which the periosteum, tendon, muscles, or other tissues about the wound are cut, and the way in which the edges of the wounds in the skin are beveled all assist in determining the distance at which the gun was fired and the position of the gun when the bullet was discharged. The gradual increase in the amount of destruction as the ball passes inward, so well seen in bone, is of great value.

**Was the Wound Inflicted by Firearms?**—If the investigation is carefully conducted there should be little room for doubt on this point. Slit-like wounds caused by fragments of a ball or bullet or by a deformed one cause the greatest difficulty. Tangential wounds, especially one caused by a charge of shot fired at close range, appear as if cut by a toothed implement or barbed wire. The discovery of shot along the

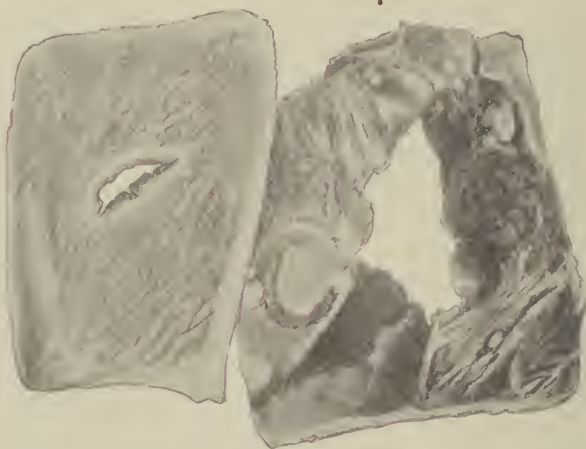


FIG. 152.—Gunshot wound of the right temporal region produced with a double-barreled rifle, which in shooting burst. To the right of the illustration is shown a portion of the skin of the right thoracic wall. It reveals a curved wound about 1 inch in length, situated between the anterior extremities of the second and third ribs.

course of such a wound was the determining factor, aside from the history, in one such case. A rifle ball may cut a clean gutter wound or may even glance from the skin, as has been noted in a case of a shot from a very small target gun. A long bullet may “keyhole” or strike side-wise, causing something like a gutter wound. Such wounds have been alleged to have been caused by a knife, but such a mistake could not have occurred if all the points in the case had been carefully studied. A round ball is generally thought to make a larger orifice than a long one of like caliber. An explosive bullet may cause a large ragged opening without the signs commonly found in gunshot wounds, especially if a bone lies beneath the part hit. Fragments of lead are usually found when an explosive bullet is used, but not when a jacketed bullet is used unless the jacket has been removed.

It has long been recognized that it is not necessary that a gun shall

be loaded with ball or shot to do serious harm when fired at short range. Powder alone may cause frightful laceration. Wadding may be very effective as a missile, as a great number of reported cases show. A few years ago a number of deaths occurred from tetanus each Fourth of July. The wounds were caused by blank cartridges discharged into the web of the hand between the index and middle finger of the left hand. These wounds were usually badly lacerated and the wad was shot into the tissues. Tetanus, developing in these injuries, was not caused by bacteria in the wads or load, but to organisms carried into the tissues from the skin. The tetanus had much the same origin as that observed earlier after cap pistol injuries in which tetanus organisms were blown into the tissues by the grains of powder which penetrated the tissues after the explosion.

Up to the distance of 5 yards or more wadding from a shotgun may leave a distinct mark, as has been proved experimentally. The wad may be seen in the air for a much greater distance. In the use of fixed ammunition in rifles in which a wad is used there is little likelihood of finding markings, for the wad is very small and light.

Powder itself, especially of coarse grain, may be blown out and act either as a charge of shot or as separate pellets according to the distance. Acting as a charge of shot it may cause fatal injury, as separate pellets, great disfigurement. Regardless of the manner of loading, a bullet from a pistol held directly against the body may not penetrate, for the compression of the air in front of the charge may cause the recoil of the missile without the production of more than a bruise.

**Is the Wound Mortal or Dangerous to Life?**—Gunshot wounds vary so much that each must be judged separately. Attention must be paid not only to the character of the weapon and load, but to the part injured, the general health, presence of abnormal anatomic conditions, and unusual conditions. Whether it is possible to obtain modern surgical treatment must also be considered. A surgeon must be able to prove that he has used reasonable care and skill in these cases to avoid blame, which would probably be interpreted to mean that he must have practised antiseptic or aseptic methods which are firmly established. A bullet may do very serious bodily harm without endangering life, such as destroying an eye or causing a deforming scar on a woman's face. Even though a wound be trivial, death may occur from tetanus or pyemia, or later from secondary hemorrhage. All these possibilities must be carefully weighed in the consideration of a gunshot wound.

**Immediate Cause of Death.**—In answering this question one should be able to show that the examination has been so thorough as to preclude the possibility of doubt as to the presence of some other lesion which had been a possible factor. In cases in which several wounds are present one must consider which one would have caused death soonest. In a case observed by Hall the carotid artery was severed, but death was undoubtedly caused by an injury to the medulla and base of the brain which was received immediately after the gunshot wound. Each case must be considered by itself.

**How Soon Will the Wound Cause Death?**—In gunshot wounds rapid death is usually due to injury of either the nervous or vascular systems. If these escape injury death is not apt to occur quickly. The soft parts or the extremities may be very severely injured and the person live for days or recover if the heart and large vessels and the brain or cord escape injury. Death from hemorrhage is not immediate, for spontaneous hemostasis may follow the laceration of tissues. Hemorrhage from large vessels which bleed into cavities may cause death relatively quickly. Rapid death has been observed after gunshot wounds of the thoracic or abdominal aorta, bleeding occurring rapidly into the thoracic or abdominal cavity.

In most cases of death from hemorrhage the patient would be capable of considerable voluntary movement before death unless other injuries interfered. A man with a renal artery cut by a bullet has been known to run 80 feet; another, with the internal carotid artery bleeding, a still greater distance. A woman, bleeding from two large bullet holes through the lungs, has been known to struggle with her assailant for some time and then crawl away. Venous is not as rapid as arterial hemorrhage unless one of the largest venous trunks is divided. Pressure from hemorrhage upon the brain or other organs or the entrance of air into the veins cannot be stated to be the immediate cause of death unless it occurred at once after the shooting.

**Was the Wound Inflicted During Life?**—The absence of bleeding, its venous character, lack of diffusion of blood in the cellular tissues, and of coagula in the wound, particularly in the mouths of vessels, point to the infliction of the wound after death. If inflicted and examined during rigor mortis the path of the bullet is less tortuous than otherwise. If the wound was inflicted shortly after death it may be extremely difficult to give a positive answer. Caspar's experiments have shown conclusively that dead tissues offer a greater resistance to missiles than living ones. An attempt at healing would, of course, be evidence not only that the wound had been inflicted during life, but that the patient had survived many hours at least.

**Would the Wound Cause Unconsciousness?**—This question frequently is of the greatest importance, for upon it depends the answer as to whether the person shot has offered resistance or changed position after the shooting. A case has been observed in which a single pellet of large shot severed the cord at the atlanto-axial joint. It was stated in this case that death must have been absolutely instantaneous. In the case of a woman of twenty-two a .38-caliber bullet passed downward and inward through the base of the heart. It seemed certain from all the facts in this case that she had not moved farther than to fall backward upon the bed. Punctured wounds of the heart and wounds of the valves do not produce such results. In a case reported by Balch a man ran a quarter of a mile and lived three days after having been shot through the right auricle by a bullet from a .36-caliber revolver. Many such cases have been reported. Death may, however, occur from



the shock of a wound over the heart even when there has been no penetration of the chest wall.

A small bullet entering the anterior part of the brain, even when causing considerable destruction of tissue, may not cause unconsciousness. Hall cites a case seen with Dr. H. L. Taylor. The man shot himself in the forehead with a .32-caliber bullet, which destroyed the anterior part of the right side of the brain and lodged, as determined by autopsy, in the fourth ventricle. He came to town soon afterward, played billiards and drank whisky freely the day after, living about eighty hours after the injury was received. According to the history there had been no loss of consciousness. Dr. Taylor had previously seen a quite similar case while police surgeon in Denver. The patient did not fall down after being shot in the head, stepped into the patrol wagon, and walked into the office at headquarters. On the second day an operation was performed, the patient dying soon afterward. The .45-caliber bullet had split, one half being found near the base of the brain. The great centers were, however, not injured. The citation of other cases is not needed to show that one might shoot himself in both brain and heart, for it is evident that a determined suicide might easily do this, and actually die from either wound in a given case.

**How Long Since the Weapon Was Fired?**—This is a question which presents many difficulties and there is considerable doubt whether any of the methods advocated in determining this have much value. It cannot be determined with certainty that the weapon was clean when fired. There may also be doubt as to whether the charge in question or a previous one contained black powder or some other variety. The chemical examination of the residue from the barrel is a very uncertain procedure. After the use of nitro powder the residue is generally less in amount and lighter in color than after black powder. The residues of some of the new explosives corrode the barrel if left long in contact with it. Even with black powder the residue varies much with its quality and the previous condition of the inner surface of the barrel. In dry climates this residue actually prevents rusting of the metal, although in damp regions the amount of rusting has at times been of value in the attempt at deciding this question.

**Accidental wounds** may be caused in a number of ways. They are more commonly the result of carelessness or ignorance of firearms than to any defects in their construction. The gun may explode if the muzzle of the barrel is obstructed. Many such accidents have followed plugging of the muzzle by snow. Accidental pulling of the hair trigger or an ordinary trigger which works easily is frequently the cause of accidental shootings. Such accidents are much less common since the introduction of the hammerless guns and the safety device. The hammers can no longer be jammed or knocked down and the gun is less frequently discharged by the accidental falling of the trigger by a cold, numb finger. Accidental shootings still occur as the result of dropping of a pistol from the holster, or the drawing of a gun with the muzzle directed toward the person through a fence or thicket. Short

barrel guns may be easily swung upon and accidentally discharged into persons who are hunting in a field, especially when wing shooting. A long barreled gun often prevents or obviates such accidents. Many so-called accidental shootings are undoubtedly intentional, as the following two cases will show: In one a man attempted to kill another and said that the gun was accidentally discharged. In another a young man, disappointed in love, tried to kill himself, and failing, stated that he had been attacked by a burglar, who, it was alleged, had taken the young man's own weapon with which he had shot him. Circumstantial evidence was very strong that no one could have been in the neighborhood who could possibly have done this. The pointing of a supposedly unloaded weapon results in death with amazing frequency.

**Was the Wound Accidental, Suicidal, or Homicidal?**—Accidental and suicidal wounds are usually caused by a weapon held near the body when discharged. Homicidal wounds may be caused by a weapon held near the wounded person at the time of discharge. Many exceptions to the above statement occur in the wounds under discussion. Suicidal wounds generally are located about some vital part easily reached, especially about the brain or heart, and should be such, in general, as might be inflicted with the weapon found or suspected without assuming any unusual or trying position. It should be noted, however, that the position need not be the conventional one. The hand ordinarily used would probably be the one employed. The position of the body has no certain relation to this question, although the finding of a body in a fence or in brush with the weapon near, as in a hunting field, would point strongly to accident, especially if the wound ranges upward, as is so often the case. Ownership of the weapon usually points to suicide. Two wounds, either one of which might be rapidly fatal, would speak against suicide, especially if it could be proved that the first one caused disability or unconsciousness. Many exceptions to this general rule exist, however. The following may be cited: A man shot two bullets into his mouth, both passing upward and out near the root of the nose. He recovered from these wounds. Two wounds occasionally result from the running of the fire or jarring down of a loose hammer. If the weapon is tightly grasped by the hand of the dead man, suicide is practically certain, if the possibility of his having been shot by another party while holding the revolver firmly in this manner can be excluded. Circumstances would ordinarily render a decisive opinion possible. Now that fixed ammunition is used little can be told from the character of the load, upon which so much stress was formerly laid.

Homicidal wounds are usually in the side or back, because such wounds are usually inflicted by stealth. This statement does not apply to wounds received in a quarrel or while the person is asleep. Wounds from several kinds of weapons, in the same subject, usually point to suicide, but a designing criminal might inflict a number of different kinds upon his victim.

Wounds made for the purpose of exciting sympathy or charity are

usually slight in character and in non-vital parts easily reached by the hand most commonly used. In one case which has been reported a damp towel was used to prevent powder marks, but the left radius was broken by shooting too low. Several wounds may be caused by the same bullet or a bullet may split either before entering the body or afterward and cause multiple wounds. The parts should be placed as nearly in position as they were when the bullet struck. The course of the bullet may then be followed and the case cleared up. Small cartridges may be fired in large weapons. If the chamber is large at the base for the use of a bottle-necked shell the opposite may happen, for the large lead ball will pass through the barrel by decreasing frequently in caliber.

The insane shoot themselves in peculiar ways. Generally, however, a wound in the back of the head or other inaccessible part points to homicide. A wound in the mouth or temple would very rarely be accidental. It is of great importance, in case of doubt as to accident or homicide, to learn if the wound could have been inflicted when the parties were in the position claimed. The wounds of entrance and exit and the general course of the bullet must correspond with the other facts in the case. If the body is bent backward as in fright, the course of the bullet fired by another in front of the injured one may be somewhat upward.

Two instantly fatal wounds may have been inflicted by different missiles at one time or by two different parties. When there is one instantly fatal wound and only one assailant it would appear that this had been the last inflicted, although it is known that a man, especially if under the influence of alcohol, is apt to empty the gun into the fallen enemy. Evidence of a struggle may throw much light upon any case, as may also the knowledge that one has been buying arms or ammunition or inquiring where to shoot to cause certain and speedy death.

Many poorly constructed revolvers have so much space between the various parts that staining of the hand occurs from the leakage of gas, especially if black powder is used. By holding the weapon in position for shooting one may easily determine if a certain stain might have occurred in this manner. The staining of the left hand, if used to support the muzzle, is commonly on the palm or the palmar surface of the first and second fingers. Peculiarities of the weapon, however, and the possibility of some very unusual position of it in shooting must be investigated.

In a case examined by Hall a bullet which was found was identified as the one which had made a certain wound from the fact that it was battered and that fibers like those of the undershirt worn were adherent to it. It was proved that this bullet had been fired from the front, not from the rear, as claimed. These facts with other evidence overthrew the dying statement of the one killed that several shots had been fired from behind the back.

**Examination of Weapon, Body, and Surroundings.**—The weapon should be carefully examined. Its position; the presence or absence of blood-stains; rust; its size, caliber, number, sights, trigger-



pull, general condition, rifling, whether loaded or not, number and exact nature of cartridges found, and whether they show evidence of having been struck by the hammer or plunger, for a man has failed to kill another as the result of misfire. Any peculiarity of the weapon should be especially noted, such as the presence or absence of a hammer or any of the safety devices. The size of the bullet is of especial importance, and it should be noted that a bullet fired may have decreased in caliber from merely passing through the barrel since the muzzle may be smaller than the ball. A bullet passing through solid bone may lose much weight, although it may be impossible to find the lead which has been lost. A bullet smaller than the base of the revolver may have

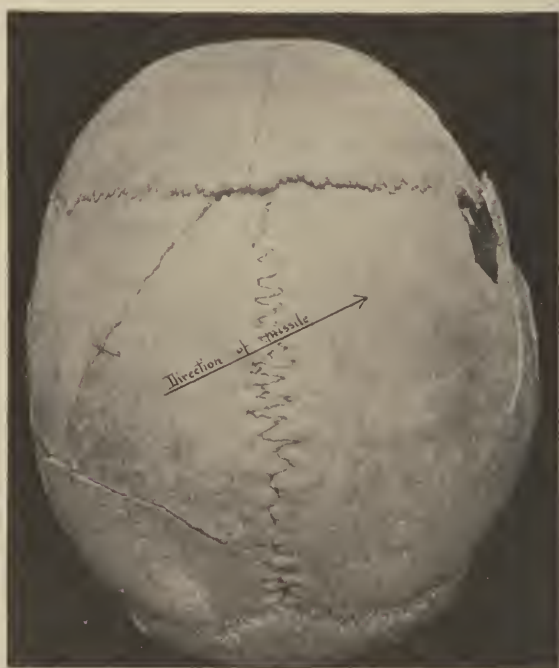


FIG. 153.—Showing irregular fissuring (also diastasis) from explosive effect of through-and-through gunshot wound. Note meridional cracks radiating from pole of impact. (Surgeon General's Museum.)

been used. The character of the rifling upon the bullet may identify it as one fired from a given weapon. Shot should be accurately measured, counted, and weighed if necessary. All the articles should be properly preserved by the proper officer.

The position of the body and the number, size, direction, and character of the wounds should be noted. The amount of blood lost and its character, whether clotted or not, and the direction of its flow may be of great importance; also whether or not it has stained the clothing. It is not at all necessary that the blood shall have flowed freely enough to stain the clothing in fatal wounds, as the bleeding may have been wholly internal. The weapon may be grasped by the hand

of the deceased or have been placed in the hand after death. If tightly grasped, it is excellent evidence of suicide, as already mentioned. As the branding and tattooing may be of vital import, these must be carefully studied. The direction in which the grains of powder were blown into the skin may prove where the weapon was held. The number of grains of powder and whether they have reached the conjunctiva in face wounds may be of importance. The hairs of the part and the fibers of clothing must be examined for evidences of burning. James established that a revolver was in the pocket, as stated, by the microscopic examination of the burned fibers of clothing. One should make a complete and thorough examination so that no wounds may be overlooked, and one should not conclude because some knife wounds



FIG. 154.—Fatal gunshot fracture: 1, Polar wound of entrance; 2, meridional fissures radiating from it, and 3, zonal fissure encircling the pole. (Warren Museum.)

are found that all of the wounds are of the same character. An *x*-ray examination of the body should be made to locate the bullet or bullets if they cannot be found by the ordinary methods of examination.

The way in which the skin is beveled and the direction of the wound may indicate from whence the bullet was fired. Tissue from the body may be blown against the wall of the room. Weil states that a sharp bullet of small caliber may make a wound easily mistaken for a stab wound. Doubtless this would be more apt to occur in a region where the skin lies in folds, such as the axilla. The direction whence the bullet came may also be shown by projecting splinters of bone or fibers of tendon, aponeurosis, or muscular tissue dragged along the course of the bullet. Photographs of the body are most valuable. Drawings, especially of the surroundings, are of great use. Unless all

the shots are accounted for, walls, fences, etc., should be examined for bullet marks. The relation of the body to bullet marks that are found is of extreme importance at times. Wadding which is found should be carefully examined and preserved, as it has repeatedly been the means of detecting the assailant.

It is well before the trial to test a weapon exactly like the one in question, with the same ammunition at different distances, in order to be able to answer questions regarding the distances at which the brand or tattooing may be found, hairs burned, or clothing fired. Hall always preserved the targets made for exhibition to the jury, using white blotting paper, unless some fabric was to be tested.

**From What Direction Was the Bullet Fired?**—This question may be answered if two points tracked by the bullet can be found, or if the bullet has made a hole sufficiently long to give one its direction. This question may be exceedingly important in determining whether the bullet could have been fired from a certain point in a struggle as alleged. A bullet leaves a hole in wood which is easily found, as a rule, and no difficulty is found in determining its direction. Kedzie has shown by experiments in connection with an interesting case that a bullet passing through glass always leaves a sharp edge on the proximal side and a rounded, conchoidal fracture upon the distal one. Balch has shown that a bullet may leave a hole in glass slightly smaller than itself; that a single pane of glass does not materially diminish the speed of a ball, and that temperature and humidity effect the breaking of glass under such circumstances. He states that the glass should be set in a firm sash for such experiments.

**Recognition By the Flash of the Weapon.**—English courts have admitted the possibility of recognizing an assailant by the flash of a revolver. Some experiments conducted by Hall have shown that one may easily distinguish letters 2 inches in height by the flash of a .22 pistol; even with a BB cap containing fulminate of mercury and potassium chlorate, but no powder, at a distance of 6 to 12 inches. The .22 short cartridge containing but 3 grains of powder enabled Hall to recognize them at a distance of 2 feet unless the smoke happened to intervene. The light from wood powder was more favorable for this purpose, sparks seeming to be present in the air for an instant, which added to the illumination, while with Schultze powder in small loads no letters could be read. It is stated that some of the nitro powders give off no visible flash in absolute darkness.

**Distinguishing Weapons By Their Reports.**—This may be of importance in determining which of two men fired first when the reports have been heard, but the shooting not seen. The larger the charge of powder, if well confined, and especially if used in a bottle-necked shell, the louder the report. If the ball or shot is taken out the report is lessened. A rifle causes a sharper crack than a shotgun. A rifle bullet screams in its passage, while shot makes a peculiar whizzing sound. The character of the weapon may be distinguished at times by the reports. For example, six shots in immediate succession



could not come from a five-shooter, nor many successive shots from a single-shot weapon of any kind. The pump gun with single barrel must not be regarded as a single shot weapon. If a bullet changes its key in flight, as I have often observed, it is probable that it has struck some object which has deformed it or that it has split spontaneously.

**Gunshot Marks in Clothing.**—The orifice of entrance generally presents evidence of loss of substance and may be ragged and irregular. The exit is rather a rent in many cases, the edges of which may be so adjusted as to show no loss of substance. It is stated by Ogston that the opening in the clothing is always smaller than in the skin. Burning of the cloth may indicate which was the orifice of entrance. Hall once proved that the shooting must have been done at a range of 2 or 3 feet by finding with a magnifying glass in a blue woolen shirt three spots where slight burning had occurred from the impingement of grains of powder, although the distance had been too great for burning by flame. Fibers of clothing at the exit may be carried along by a battered deformed bullet and be demonstrable with the microscope.

**How Long May the Smell of Smoke Be Detected in the Room?**—This question may assume considerable importance. Hall found that after firing several times with a .38-caliber revolver in different rooms, some closed and some partly open, in an ordinary dwelling that the odor could not be detected after from ten to forty-five minutes.

**Brand, Tattooing. Estimation of Proximity and Position of Weapon.**—Frequently, especially when deciding between homicide and suicide, the above-mentioned headings are of great importance and may be considered in association with one another to save repetition. It has been proposed to estimate the distance from which a ball was fired by calculations based upon the charge of powder, weight of bullet, and the penetration. This cannot be done in wounds of the human body, for no calculation can be properly based upon the work done by the bullet in the body, as no two cases are alike. A bullet might be battered by its first impact with bone and its further penetration considerably reduced or interfered with. The factors of most importance are the staining left by the partially burned grains of powder blown out with the ball, and the brand, or burning by the gases of combustion, when they are present. When these are not found the weapon must have been fired at a considerable distance. If none of these signs are present the distance cannot be estimated unless the bullet is spent. When a shotgun is used a study of the area covered by the wounds will sometimes avail in showing approximately the distance at which the gun was fired. Ordinarily the body would be burned if the distance were so short that the charge would enter as one mass. It is possible for a paper shell to break off and go with the shot, which is thus held together for some distance. When the wound is stained by powder something must first be learned of the size and character of the weapon. A long barreled rifle or shotgun will cause as much staining at 2 or 3 feet as a small pistol at a few inches. Good powder stains less than poor, as combustion is more complete. Imperfectly burned grains

cause the tattooing. A few grains in process of combustion, some possibly sticking to the lubricant upon the ball, are blown out by the



FIG. 155.—Brand and tattooing from .38-caliber Smith and Wesson revolver, Smith and Wesson cartridge, 4-inch barrel, white blotting-paper, as follows: *a*, Muzzle 2 inches from paper, sight upward (ordinary position); *b*, muzzle 6 inches from paper, sight held to the left (that is, the weapon was revolved one-quarter to left on long axis); *c*, muzzle 10 inches from paper, sight downward (pistol inverted); *d*, muzzle 15 inches from paper, sight held to the right. In *a* the whole field is smutted, brand above the bullet hole, powder marks distributed nearly equally about bullet-hole. Extensive firing of paper. In *b* brand shows to the left, less smutting, broader area of tattooing. In *c* brand shows underneath bullet hole, retreating from it. Still broader area of tattooing, more on side of the brand. In "*d*" brand has nearly disappeared, showing but slightly to the right. Tattooing still broader and more on side of brand. There was no fire to be extinguished except in *a*.

explosion. These are too light to travel far, but may stick in the target at a distance of several feet. Coarse blasting powder used in

mines has been known to stick in a board 15 feet distant. If the powder be of too coarse grain for the weapon in which it is used, it is found more abundantly about the place struck, while if highly glazed it may fire with difficulty and therefore be found abundantly.

Fixed ammunition in breech-loading weapons is used almost exclusively today, and as the factories load the ammunition in a way to



FIG. 156.—A Smith and Wesson .38-caliber revolver with 4-inch barrel, Smith and Wesson cartridge, was fired at a muzzle distance of 4 inches at a piece of Canton flannel. About the bullet hole the cloth was entirely consumed, burning slowly until extinguished. Immediately, especially at the location of the brand, the nap of the cloth was destroyed by the burning gases, while scattering spots show the places of impingement of separate grains of powder. The burning from the latter cause is better shown in the upper segment, ignited at a distance of 7 inches. In this piece of goods it is evident that this mode of ignition is insufficient to destroy the cloth, even at the shorter distance.

secure the best ballistic results there is less ground for error than formerly.

It is difficult to lay down any definite rules in these matters, since most of the shootings are done by weapons which vary from .22 to .45 in caliber and with a length of barrel varying from 2 to 10 inches. In order to obtain an exact statement one must experiment with the weapon and the ammunition in question. Even two revolvers of the same size and appearance may vary widely, the one being of good



make and confining the gases tightly; the other being poorly made and shooting badly. The better made weapon stains at a considerably greater distance because of its greater ballistic force and also produces the brand, which is better defined, at a greater distance. It would even be possible by experimentation to determine in some cases which of two weapons had fired a certain shot, if the appearances upon the body were well marked and the differences in the weapons were considerable.

In making such experiments it is important to see that the weapon is in as near the same condition as possible as regards foulness of the barrel as at the time of the shooting. Accumulated dirt may be blown out and obscure the target, so that little can be told. The bluish stain seen at the edge of the bullet hole regardless of the distance comes from the lead of the bullet and must not be confused with what is now being considered.

Generally speaking, the tattooing and the brand will be the more distinct the less the distance of the weapon from the target, the heavier the weapon, and the better it is made. If the muzzle is held within an inch or so of the target there may be only burning about the edges of the bullet hole without distinct brand or tattooing, all being merged with the blackening about the edges of the orifice. The brand is generally not seen when the pistol is held at a distance exceeding a foot. When the rifle or shotgun is used it is found at greater distances, depending upon the load, size, and caliber.

At a distance several times that at which the brand is seen tattooing is still distinct, for the grains of powder are carried several times as far as the gases causing the brand. The grains of powder ignite less readily as the distance from the muzzle is increased, being more thoroughly burned in the discharge. Grains found within a few inches of the muzzle in tissues that have stopped the burning immediately may scarcely differ from the unfired grains. In one of Hall's cases, in which fingers which had been shot off were preserved in alcohol, it was found that soaking in alcohol for days did not impair the explosiveness of grains of powder when touched with a cautery or coal. The size of the tattooed spot increases up to the point at which it grows fainter as the distance increases. The same rule applies, but with less force to the



FIG. 157.—Grazing gunshot wound of the right external ear, with scattered grains of powder in its vicinity.

brand, the natural spreading of the grains and the gases accounting for this. The tattooing has very different limits than those of the brand. The latter is found only above the bullet hole, while the tattooing is found all around it, but more especially above. The brand is found immediately above the bullet hole when the weapon is fired at short range, and becomes farther and farther removed as the distance is increased until it becomes too faint to be distinguished.

As the brand is superficial it disappears as the wound heals if life is prolonged. The tattooing being mostly beneath the surface remains permanently if any part of the true skin is involved. It gradually grows fainter, as do all powder stains, for some months assuming a bluish shade. The majority of grains of powder are too superficially lodged to remain permanently. They separate spontaneously in a few days with the superficial epidermic scales without scars.

The position of the brand is of great importance and it is advisable to look into the origin of the brand more closely. Fisk has shown that the reason for its constant position as regards the bullet hole is due to the tendency of the weapon to rebound at the instant of discharge. The weapon is supported below its center owing to the drop of the handle. The force of the recoil being applied above the point at which the pistol is supported, the weapon tends to revolve around this point as a center. The kick of the weapon throws the muzzle upward. The gases of combustion being necessarily behind the ball tend to assume the new direction of the barrel caused by the rebound. The gases strike, therefore, above the bullet hole. This explanation also shows why the brand is farther from the bullet hole as the distance increases.

Since the largest pistols equal or even surpass small guns in ballistic power, no rules regarding the brand and the tattooing can be laid down, especially as these vary markedly with different grades of ammunition and different makes of weapon. Many experiments have been made by Hall, but only those made with the smallest pistol in common use, the .22-caliber revolver, which may be taken as a guide in testing other weapons and different kinds of ammunition, will be given.

With the BB cap, containing no powder, but only fulminate of mercury and chlorate of potassium, fired from a 2 $\frac{1}{4}$ -inch revolver the brand may be seen at times distinctly up to 3 inches. It resembles that caused by gunpowder, but is not so dark in color as that caused by powder. The blotting-paper was not set on fire at the shortest distance tried, although burned spots showed where burning spots struck. With the .22 short cartridge, burning 3 grains of powder, the paper took fire once out of four times when the pistol was discharged at a distance of 2 inches. The brand showed distinctly at the upper edge of the bullet hole. At 4 inches the brand had passed from the hole, but still showed with great distinctness. No firing of the blotting-paper was noted at this distance. Tattooing was distinct, being more marked above than below the bullet hole. At 6 inches the brand was fainter and farther from the hole. At 8 inches it could not be made out distinctly in some cases. At the distance of 1 foot no brand was visible, but tattooing

could still be seen. Some tattooing, although slight, was still seen at a distance of 24 inches. With American wood powder, loaded in a 22 short shell, the paper took fire at 2 inches on but one occasion, never at a greater distance. The brand was distinct at 2 inches and less so at 4 inches and did not occur at a greater distance. The tattooing was less than with black powder and about the same at 1 foot as with black powder at 2 feet, the staining being slate colored rather than black. With Schultze's shotgun powder the brand was fainter than with the preceding and not seen at more than 4 inches. Combustion is so much more nearly perfect with this than with other powders that practically no tattooing was found, although a bluish stain resulted apparently from the gases, disappearing at 6 inches. Like some of the other new powders, this one must be fired with a strong firearm or it will be blown out unexploded, appearing as flesh colored or brownish particles about the bullet hole. The paper was not ignited even at 2 inches. With larger weapons these distances are materially increased. Hall has always made the experiments in each case with the conditions as nearly like those of the case being tried as possible and has shown the targets obtained to the jury. Tattooing is possible up to 8 or 10 feet with the heaviest revolvers, *but* is generally seen only at much shorter distances. Between the point at which tattooing disappears and that at which the bullet becomes spent little can be told of the distance at which it was fired. A very foul barrel may lead to the turning of the bullet side-wise, or "keyholing" as it is termed. This last point would be of use only in proving that the bullet was not necessarily spent, for it has occurred at 40 feet in using a 40-82 rifle, due to a leaded spot just within the muzzle, and at a distance of 6 inches in a small .22 revolver. Balch found that the lubricant was adherent to a Smith and Wesson .38-caliber bullet fired with 9 grains of powder up to a distance of about 10 feet.

Mention has been made of marks left by wadding. They have frequently been seen up to a distance of 5 yards when a 10 gage shotgun was used. The spread of shot from a shotgun must be determined experimentally. The finding of the shot in a body in one mass does not always mean that the range has been very short, for the paper part of the shell may tear off and hold the shot together for great distances. This happens but rarely. Staining about the wound will always be found if the charge has been fired at short range.

The penetration of modern rifles is so great that this gives but little help in determining the distance at which the shot was fired. So many other factors enter into the decision that even with pistols it is of little value. Clothing may be fired by the flame issuing from the muzzle or the space between the cylinder and the barrel of a revolver. This proves that the shot must have been fired at close range. Rags or paper used as wadding may fire grass at many yards distance. Hall in a trial found that a .38-caliber Smith and Wesson revolver fired a cambric night dress every time at 6 inches, the fire having to be extinguished to prevent destruction of the garment. At greater distances it caused burning at times, even up to 12 inches.



Firing or ignition may occur from two distinct causes, from burning gases at the point where the brand shows most plainly, and from separate burning grains of powder blown out by the discharge. Ignition may occur at a considerably greater distance when due to the grains of powder than to the gases. Pieces of wadding may act the same as grains of powder. Closely woven fabrics ignite with difficulty from gases. If a nap is present they ignite more easily. If the burning powder grains become lodged they may ignite any fabric.

Hall in one trial proved by shooting at different angles at cambric spread over blotting-paper that at angles much less than a right angle the cloth deflected grains of powder from the paper, so that no black mark remained, although at this angle they were easily driven through. At 20 degrees the cloth showed long black marks where grains of powder had glanced along its surface with only slight roughening of the soft paper underneath. This made plain why, in a shot striking only the tip of the shoulder, no powder staining was to be found, although probably the kicking upward of the muzzle contributed by lessening the number of grains striking the part. The brand gave no information, for the shot had been fired at such short range that the garment was destroyed by fire over the entire region of the shoulder. In another case in which there were two wounds nothing could be learned concerning the direction from which the shots were fired, for the dress prevented tattooing in one wound and the brand was destroyed by the fire which resulted from the close range at which the shot was *fired*.

Rapid changes in powders and firearms makes it almost impossible to discuss the different phenomena associated with their discharge and the character of the wounds and the concomitant changes. Each case must be individualized, and when a trial is being held the targets should be reproduced under conditions as nearly as possible like those under which the wound was made. Park has well said that one "must use experience, care, observation, and reasoning." The expert in gunshot wounds must experiment with the weapons which were used under conditions as like as possible to those under which the wound was caused. There is no department of legal medicine in which more brilliant results may be obtained by the expert than in that relating to gunshot wounds.

## BURNS AND SCALDS

Surgically, burns and scalds are classified as wounds, but are usually considered under a separate heading. Medicolegally, they are regarded as bodily injuries, frequently accompanied or followed by scars which may be very disfiguring. They frequently endanger life. Even the milder degrees if involving enough of the surface of the body may prove fatal. A burn is caused by exposure of a part or the whole of the body to a heated material, a flame, radiant heat, or electricity. A scald is produced by the action of hot liquids or to vapors arising from them. The scald differs from the burn in that it causes no charring of the skin, no singeing of the hair. The latter is due solely to flame or to heated

metals. Complete destruction of the part or subsequent gangrene may nevertheless follow scalding.

Internal structures may be affected by burns and scalds, although when speaking of these we usually think of the external surface being



FIG. 158.—Death from burning (Hofmann). Body of a man found, excessively burnt, beside a railroad track. The body had about it an odor of petroleum. No injuries to the body were discovered. Aspirated soot was found in the air-passages, and from this fact it was concluded that the burning had occurred during life. All vestiges of hair had disappeared. The clothing, with the exception of one shoe, had been entirely consumed. The surface of the body was blackened and appeared as though roasted. Here and there the skin was burst.

The burning was evidently the result of applying a match to the clothes, previously saturated with petroleum. Whether the case was one of murder or suicide could not be positively determined. The peculiar position of the body probably developed postmortem, and was due to the contractions of the burnt skin and the musculature drawing up the extended body. Similar abnormal positions have been often observed in cases of deaths from burns.

affected. Frequently the throat is scalded by hot liquids and inhaled steam. Molten lead has been swallowed accidentally, causing death.

The intensity of the burn depends upon the degree of heat and the time of exposures. Burns vary in degree from slight reddening or

hyperemia to charring with almost complete destruction of the part involved. Scalds are usually less severe than burns, but when caused by boiling oil or tar or other sticky substance with a high melting-point, scalds may be very destructive. Molten metals often adhere to the part struck and burn deeply and severely. If heated to the boiling-point of water metals cause only blisters and reddening when applied to the skin. The burn in such a case usually corresponds in size and shape to the metal used. Molten metal usually spatters over the exposed part, causing multiple foci. Because of vaporization of the moisture of the skin momentary contact with hot metals, even at a red heat, may do but little damage to the part exposed.

Corrosive chemicals cause burns when applied to the skin. When taken internally esophageal stenosis and ulcer of the stomach may seriously interfere with vital functions and threaten life.



FIG. 159.—Appearance of granulating wound following burn. (Mock, "Industrial Medicine and Surgery.")

Burns caused by explosions, especially of gunpowder, are often very extensive, frequently superficial, and when due to the explosion of powder are accompanied by extensive tattooing due to the driving of unburned grains of powder into the skin. Burns caused by petroleum oil leave a distinct and characteristic odor even after days, and a carbonaceous residue is left after combustion ceases. Persons burned by explosions of fire damp and other gases, especially in coal mines, often have dark carbonaceous particles driven into the skin, but these are much less uniform in size than those associated with powder explosions.

Sulphuric acid is the chemical agent probably most frequently used with criminal intent. It produces a brownish, almost black stain, nitric acid a yellow one, and hydrochloric acid a yellowish or brownish-



yellow one. The reaction following these chemicals, unlike that from a burn, is soft and moist, the hairs are not burned, nor is there an area of reddened skin which usually surrounds a burn. The spots found upon the clothing usually assist in determining the nature of the chemical used. These have a more or less characteristic staining. Chemical analysis is also of importance in determining what was used.

Burns and scalds vary. The following degrees are recognized:

**First Degree.**—Hyperemia of the skin. Sunburn is the most typical example of this degree.

**Second Degree.**—The second degree burn is characterized by the formation of blebs or blisters. These come on immediately or within a few hours. If the skin only is destroyed a white shining scar is frequently left, without much contraction. Burns causing extensive destruction of tissue are followed by scars which cause marked disfigurement and deformities.

**Third Degree.**—Third degree burns are associated with charring and destruction of tissues. These may be followed by gangrene, either from mummification of dead tissues or from involvement of the principal artery of the extremity.

**Fourth Degree.**—This degree burn is not recognized by all. It is characterized by actual destruction of the part affected. The typical example is destruction of a leg and foot, such as occurs in mills when molten metal is accidentally poured over a part which cannot be extricated.

Scalds are almost always accidental, burns usually so. The injuries due to chemicals are also usually accidental. Burns may be intentionally inflicted or an attempt may be made to cover up a crime by destroying the body by fire. Chemical agents may be used externally to cause death or disfigurement or may be taken internally for suicidal purposes.

The local results of burns are most varied. Blisters are found as a rule. These contain an albuminous fluid; have a reddened base and are surrounded by a reddened skin—the first degree burn. The nails may become detached when scalded, the epidermis and the nails frequently coming off in the form of a cast. The skin when scalded may present any appearance from redness and blistering to a sodden ashy color.

Shortly after a burn is received a red line of demarcation forms between the sound and burned tissues. This is deeply injected. It is not found when a dead body is burned. In the severer degrees of burns there may be cracks or fissures, especially near the joints. These vary in depth and extent with the degree of heat and length of exposure. They have ragged rather than clean-cut edges, and blood-vessels which are not readily destroyed by fire may stretch across the fissures. There is but little effusion of blood into the surrounding adipose tissue. These characteristics are important points in the exclusion of incised wounds inflicted upon the living and afterward exposed to fire for concealment. These fissures may open the large cavities of the body. At times their edges are covered with melted fat which has escaped from within.

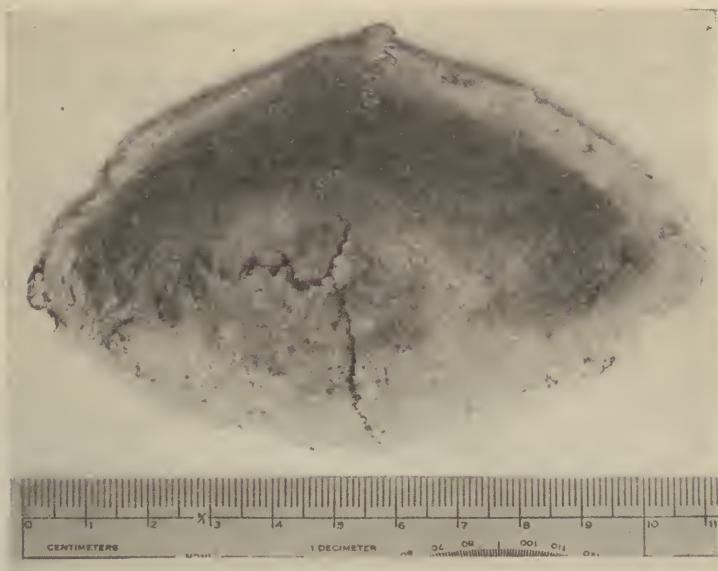


FIG. 160.—Sequestrum of parts of the parietal and frontal bones, including both tables, which was removed eighteen weeks after the accident. The sequestrum was so loose by this time that it could be removed with tissue forceps. The underlying dura was covered with healthy granulation tissue. The superior longitudinal sinus was intact. (Lewis, in *Annals of Surgery*, J. B. Lippincott Co.)



FIG. 161.—Size of defect following removal of sequestrum. Defect has been covered with Thiersch grafts. (Lewis, in *Annals of Surgery*, J. B. Lippincott Co.)

Wounds of the soft parts only and marks of strangulation are entirely erased by charring.

Severe burns may be accompanied by severe shock. Death may occur within twenty-four to forty-eight hours and be associated with a high temperature, rapid pulse, diarrhea, and all the symptoms of severe intoxication. The autopsy findings in these early deaths are not unlike those of a severe infection, the focal necrosis in the parenchymatous organs resembling those found in the fatal cases of scarlet fever and some of the other infectious diseases. If the patient lives a few days death if it occurs is usually due to infection, tetanus, gangrene, or intestinal lesions, such as duodenal ulcer, which may give rise to a fatal hemorrhage.



FIG. 162.—Shows burns over the right parotid gland and facial palsy. The peculiar expression of the eye is due to the cataract. (Lewis, in *Annals of Surgery*, J. B. Lippincott Co.)

Most of the deaths from burns occur within the first six days, some occur after many weeks. The coma associated with burns must not be confused with that caused by the too free use of opium, which drug must often be freely used to control the terrible pain and nervous shock associated with extensive burns. Billroth's statement that a burn which involves one-third the surface of the body, regardless of the degree of the burn, is fatal is practically always true.

**Postmortem Appearances.**—When seen at the morgue the body often presents evidence of immediate death from asphyxia due to smoke and the products of combustion or from injury due to falling walls. Syncope from fright and collapse from severe injuries doubtless



account for many deaths, associated with but few and not striking postmortem findings. If death has not been immediate and has not been due to causes mentioned above, pneumonia, bronchitis, pulmonary edema, or, especially in scalds or in cases where heated air has been inspired, edema of the glottis may be found.

Suffocation from carbon monoxid may cause the blood to have an arterial hue totally different from that where there has been simply deprivation of oxygen as in ordinary suffocation. The study of the condition of the blood in those burned to death has not been satisfactory. The results of the different investigators are not in accord. The serous membranes are often hyperemic and may contain considerable effusion. Ecchymoses are at times found in the lungs. Ulceration of the lower end of the esophagus, of the intestines, and espe-



FIG. 163.—Indicates the extent of the injury to the feet. The flap covering the granulating surface above the left ankle anteriorly has been turned down from the side of the leg. This area has not yet been covered with grafts. (Lewis, in *Annals of Surgery*, J. B. Lippincott Co.)

cially of the duodenum are common. Death has occurred from hemorrhage from such an ulcer. The heart cavities are generally empty, although the right side may be full of blood. The brain, liver, kidneys, and pelvic organs are often changed, and, as previously stated, focal necrosis may be found in any or all of the parenchymatous organs.

In the examination anything which may aid in establishing the identity of the subject should be noted. The approximate age may be determined by observing the processes of ossification in the bones and the condition of the epiphyses. If the pelvis is found it will aid in determining the sex of the subject. If the body has been destroyed the ashes should be sifted, as pieces of bones may be found, or artificial teeth, buttons, jewelry, and other articles which may be of value in establishing identity recovered.

**Date at Which Death Occurred.**—Examination may reveal supuration, which indicates that at least two or three days have elapsed

since the burn was received. If the burns did not occur at the same time different stages in the pathologic process will be observed in them. It requires from six to fourteen days for ulcers of the intestines to develop after burns. Cicatrization of such an ulcer requires many weeks or months. Knowledge of general pathology is an essential in making this examination.

**Prognosis.**—The prognosis depends upon the area involved rather than upon the degree of the burn or scald. Billroth several years ago stated that a burn which involved one-third of the surface of the body, independent of its degree, was almost certainly fatal. The cause of death in these cases cannot always be determined, but it undoubtedly is in part due to changes in the parenchymatous organs. Death has been said to be due to shock, loss of heat from exposure of capillaries, toxemia, and a number of other causes. Even a burn involving one-fourth of the surface of the body or, according to Smart, 350 square inches may be fatal. Burns or scalds of the trunk, especially those involving the lower abdomen and genital region, are more dangerous than those of the extremities. They are most dangerous in children and nervous women. Extensive powder burns are said to be peculiarly dangerous. Wounds scattered over the body that interfere with rest and cause considerable pain when being dressed may add to the gravity of the prognosis.

**Did the Burn Occur Before or After Death?**—This question is frequently of great importance. If blisters are present and contain a highly albuminous fluid, are surrounded by a red line of demarcation not disappearing upon pressure, with a bright or copperish-red color of the surrounding skin, and present, after rupture, a red blister it is certain that the burn occurred before death. A blister with a reddish but slightly albuminous fluid, or containing gas, without redness of the surrounding skin and a red base after rupture would have a contrary significance. As severe depression of the bodily forces may prevent the immediate development of a blister, which may develop when a reaction occurs, the absence of the blister must not be regarded as meaning that the death had occurred at the time of the burn. The experimental studies by Taylor, Leuret, Stoddard, Caspar, and others have shown that, in general, the distinction may certainly be made, although blisters develop, especially upon dropsical subjects, some hours after death, and be raised by hot water very shortly after death. There should, however, be no occasion for error in confounding blisters with bullæ of putrefaction.

If the body is charred it will be impossible to tell whether death preceded the burning or not unless, for example, a skull fracture, perhaps associated with a blood-clot, should be found. If such were discovered one would be justified in assuming that death preceded the burning or at least that the patient was unconscious at the time. It is impossible to tell whether the chemicals which have been discussed were applied before or after death unless the vital reaction which is associated with such burns is present.

**Accident, Suicide, or Homicide?**—Nearly all the injuries now being discussed are accidental. Murderers and suicides often try to cover up their tracks by setting fire to surrounding furniture or buildings. It should, therefore, not be too quickly assumed that the burning has been accidental. Suicide by burning has been known, the clothing having been saturated with oil and a flame applied. Suicide by this means is rare. Dr. Hugh L. Taylor recites the details of a supposedly accidental death from the burning of a cabin in which the man lived. On examination an antemortem bullet hole through the head, entering through the mouth, making suicide practically certain, was found. Fractures, especially of the cranial and facial bones, afford presumptive evidence of antemortem violence. The position of the body, condition of the clothing, if any remains, evidences of a struggle, depth and character of wounds, all the circumstances, must be investigated. The subject may have been burned to death after having fallen into the fire as the result of an epileptic seizure or syncope. A body may be completely destroyed within ten hours by means of fire, but such a result is extremely unlikely with the ordinary fire. Analysis of the ashes after a fire has been suggested in case there is a suspicion, for bone contains calcium phosphate.

**Immediate and Later Results.**—Burns and scalds are apt to be followed by very disfiguring scars, especially about the face and neck, and disabling scars when the extremities or hands and feet are involved. In burns about the chin, neck, and chest the chin may be bound to the chest and the lower lip be greatly deformed. With this deformity of the lower lip drooling is very apt to occur. Suits for damages because of the deformities or disabilities associated with or accompanying burns are not uncommon.

### CICATRICES

A cicatrix represents the newly formed tissue which replaces normal tissues destroyed by wounds, burns, or other injuries. Destruction of the whole thickness of the skin must result in a scar, which will remain visible ever after, although it is known that slight incised wounds, without loss of substance, may not leave easily found traces, although histologically such traces could probably be found. The chief reason for this permanence of cicatrices lies in the fact that the blood-vessels in the newly formed tissue never develop sufficiently to give it the same color as that of the normal skin. Even if not easily found, rubbing or slapping the region often reddens the surrounding sound skin, when the scar, incapable of such reddening, shows distinctly by contrast. Drawing the skin tightly, as upon the fingers, mechanically squeezes out the blood in the cicatricial tissue so that it shows distinctly oftentimes. Owing to the destruction of hair-follicles and glands of the skin no hairs are seen in a true scar, and no sweating occurs, so that dirt does not so readily adhere to the scar as to the normal skin. These are important points in the study of marks, especially in colored races and in investigating cases of leukoderma.



Because of their permanence scars are often of great value as a means of identification, most individuals having received, at some time, injuries upon some part of the body which leave indelible evidence of their existence. Indeed, so well established is the fact of permanence that for ages the owners of stock upon free ranges have depended upon scars produced by burning and cutting certain areas of the animal's body as a means of establishing ownership.

Scars may be much smaller than the weapon inflicting them, because of the marked contraction which occurs in healing, especially in case of considerable loss of substance. When the skin is loose, as upon the genitals or in the axilla, the scar may be irregular, although following a wound inflicted by a straight weapon, owing to folds in the skin. Such cicatrices may not be half the length of the original wound.

It is well established that scars may increase in size with increasing stature. Without quoting the many authorities and recorded cases, it will suffice to mention the well-known fact among stock-growers that the brand left by a hot iron upon the skin of a colt or calf may in a few years become larger than at the time of branding, and that, furthermore, it may change slightly in shape as well, from retraction occurring about it.

It is commonly stated that a scar will result if the whole thickness of the skin is destroyed, but an opposite inference is not always justified. Hall has noted scars left by burns so slight that only the superficial layers of the skin were destroyed, so that the hairs and papillæ of the part remained, proving that the true skin had not been destroyed. Such scars are lighter in color than the normal skin, some disturbance of pigment formation being operative.

Birth-marks may atrophy and disappear with adolescence, as may the nevi of traumatic origin, without leaving a trace. In one of Hall's cases an instance of the latter nature occurred, the nevus upon the face having been distinct for some five or six years after a fall from a horse. No material cicatrix remains after the removal of small nevi by electrolysis in some cases, although it is common to observe the scars left after removal, by this or other means, of moles and other marks, upon the faces of women particularly.

It should be noted that scars may be changed in appearance designedly by the addition of further injury, as is so commonly done by stock thieves in the West in making over one brand into another, although no portion of the original scar can be removed without the removal of the skin, leaving, at the least, a linear cicatrix. Thus, for example, a tattoo-mark may be so added to as entirely to change its general effect, and, after the inflammatory changes following the infliction of any wound have subsided, the change may be undiscoverable.

The presence of scars must not be too absolutely depended upon for identification, as instances have occurred where, by strange coincidence, two persons have been found with practically identical marks. A very minute description of the scars would almost certainly obviate such a difficulty if it could be obtained.

Attention is called to the scars of cuts upon the fingers as a means of confirming or disproving statements that one is or is not right or left handed. Almost all males use edged tools, particularly the pocket-knife, sufficiently to incur cuts, and hence cicatrices occur upon the hand in which the object to be cut is held, therefore upon the hand in which the knife is not held. Although many persons learn to write with the right hand if born left handed, most persons use the knife with the hand which nature originally designated as the more skilful one. The ease with which one may distinguish, in well-marked cases, which hand is chiefly used in the manner mentioned is astonishing, and, in the case of a body presenting cuts—for example, made in such a manner as to indicate that the one making them had been left handed—this method would be of great value in testing one's statement as to which hand he chiefly used, the evidence in such cases in the past having often been very contradictory. Accidental gunshot wounds are generally upon the hand not used in holding the stock.

**Tattoo-marks.**—Because of their permanency, and the fact that they cannot be obliterated without leaving a tell-tale scar, and further, because they remain until after putrefaction is well advanced, tattoo-marks are of vital importance in establishing identity in certain cases. For a full discussion of this subject the reader is referred to pages 115 and 158 of this volume.

Accidental tattooing is extremely common. I have seen several slight markings left from wounds by a pen, and many from a rusted hypodermic needle, the latter particularly in morphin habitués. Many cases are due to the accidental blowing of powder-grains into the face, the markings being small and abundant if gunpowder be the active agent. Some half-dozen cases in which the powder has been blown out from the breech of a gun, after the manner described in the section upon accidents from firearms, have occurred in our experience, and we have seen many others. When the weapon is held, as it commonly is, upon the right side, the staining affects chiefly the right side of the face and nose, the left side of the latter organ often escaping entirely because of its being in a position practically parallel with the course of the flying grains of powder. The conjunctiva, especially of the right eye, presents the bluish stains permanently, even though attempts be made to remove the powder. This tattooing is very characteristic of this form of accident.

Scattered bluish marks are often seen upon the faces of miners, where the substance mined or the coarse powder used for blasting has been the cause. We have seen them chiefly in coal- and iron-miners.

Gunshot cicatrices are commonly depressed, smaller than the bullet, adherent, smaller at the place of entrance than at that of exit, as a rule, and developed later, we are told, because of the longer time of healing. There must be many exceptions to the alleged rule, however. Scars from syphilitic and scrofulous processes have been mistaken for gunshot scars, while a triangular blade has left a round scar similarly mistaken.

In the Aokid trial Hall was asked if the depressed circle upon the ring-finger of the woman killed, and whose fingers, severed from the body at the time, had been preserved in alcohol and were presented in court, was the result of the pressure of a ring alleged to have been worn upon that finger. He could only state, of course, that in all probability it was the result of the wearing of the ring. Harris has called attention to the similar depression upon the legs of women from the wearing of circular elastic garters.

In one of his cases Hall was able to affirm that a man of about twenty-five years had formerly been much heavier than at the time of the observation, from the abundance of lineæ albicantes visible, especially in the loose skin in the region of the shoulders, whose presence could be explained only upon the theory that he must earlier in life have suddenly grown more corpulent. Such proved to have been the fact. The presence of these linear scars about the hips of virgins is not uncommon,



FIG. 164.—Right hand of a left-handed machinist, showing typical scars of accidental cuts (drawn from life by Dr. W. C. Bane).

though not mentioned commonly, their development being doubtless synchronous with rapid growth at the time of puberty.

Many bodies present the cicatrices of former cuppings, vaccinations, attacks of herpes, particularly along the intercostal lines, venereal sores, small-pox, chicken-pox, boils, carbuncles, setons, buboes, etc., the nature of all being generally sufficiently obvious. The oft-quoted statement that cicatrices in the groins point to syphilis is distinctly incorrect, for they point very forcibly to a non-syphilitic venereal sore or some other process which has caused suppuration in the glands—well known to be rare in syphilis. This statement has probably been handed down to us from the time when confusion existed regarding the different venereal diseases. It is stated by Ogston that the chancroid may leave no scar, although the initial lesion of syphilis probably always leaves distinct traces.

Scars upon the tongue suggest epileptic convulsions, in which the



organ has been bitten. When horizontal depressions are found upon the nails, one may infer that an exhausting disease has recently been present, since these marks "grow out" in a few weeks. The depressions in the developing teeth left by certain eruptive diseases might be of value for identification, or serve as proof of the time of the disease. The exceedingly characteristic cicatrices left by certain pathologic processes upon the liver, heart valves, and other internal organs call for mere mention. Scars upon internal organs need not necessarily indicate that, in case of wounding, the organs have been directly touched by the weapon or missile.

## RAILWAY INJURIES

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THE first railway accident of which we have read occurred September 15, 1830. On this date the railway between Liverpool and Manchester was opened for traffic. The Duke of Wellington; the Rt. Hon. William Huskisson, statesman and financier, the celebrated pioneer of free trade; several diplomats, and many other distinguished persons were on the train. We learn the story from the writings of Miss Fanny Kemble.<sup>1</sup> She tells us that the train had stopped at Parkside to water the engine. Huskisson descended and stood upon the opposite track. An engine, the "Dart," coming up unobserved on that track struck him. Miss Kemble tells us that Huskisson "was instantly prostrated by the fatal machine, which dashed down like a thunderbolt upon him, and passed over his leg, smashing and mangling it in the most horrible way."<sup>2</sup> Nine hours later he died.

Such an enormous number of people travel by railway that many casualties are inevitable. In the United States laws for the prevention of casualties are stringent, are numerous, and are being added to at frequent intervals. Great sums of money are expended annually for the multiplication and perfection of safety methods and devices. Because of such precautions we would anticipate a yearly decrease in railway mortality, yet later figures do not quite bear out such a cheerful forecast.

The Encyclopædia Britannica (1911) informs us that during the year 1907 in the United Kingdom there were 1211 persons killed and 25,975 injured as a result of railway accidents; that in France during 1907 as a result of the same sort of casualties there were 659 killed and 1315 injured; and that the total number of casualties due to railway accidents in the United States during 1907 were 11,839 killed and 111,016 injured. The figures for the United States are substantiated by the 22d Annual Report of the Interstate Commerce Commission.

The World Almanac for 1907, in discussing railway casualties, shows that whereas in 1897 one passenger was injured out of 175,118 carried, in 1905 one passenger was injured out of 70,654 carried; in 1897 one passenger was killed out of 2,204,708 carried, while in 1905 one passenger was killed out of 1,375,856 carried.

The Interstate Commerce Commission in its 22d Annual Report showed that for the year ending June 30, 1907 there were employed on

<sup>1</sup> Fanny Kemble, *Records of a Childhood* (quoted in *The Railway Surgical Jour.*, March, 1916).

<sup>2</sup> *Ibid.*

the 229,951 miles of railway operated in the United States on an average 735 employees per 100 miles of line; that 873,905,133 passengers were carried; 610 passengers, 4534 employees, and 6695 outsiders, including trespassers, were killed; 13,041 passengers, 87,644 employees, and 10,331 outsiders, including trespassers, were injured. The steam railways of the United States pay annually in dividends and interest about \$848,000,000. They pay annually in damages to injured persons 0.75 per cent. of their gross earnings and about \$1,000,000 to their legal advisors.

United States Railroad Administration Bulletin for January, 1920 (No. 7, Vol. 1) gives the following figures (based on the accidents reported under Interstate Commerce Commission regulations) for the first nine months of 1917, 1918, and 1919 respectively:

January to September, 1917, employees killed or injured.....	134,959
and others killed or injured.....	19,977
January to September, 1918, employees killed or injured.....	119,853
and others killed or injured.....	18,532
January to September, 1919, employees killed or injured.....	94,866
and others killed or injured.....	16,624

It would be interesting to know just how many were killed and how many were injured, but the Railroad Administration modestly refrained from stating.

W. J. Cunningham, in *The Encyclopædia Britannica*,<sup>1</sup> gives the total number of casualties to persons in train accidents and train service accidents in U. S. A. as follows: For the year 1917, 9567 killed and 70,970 injured; for the year 1918, 8697 killed and 64,144 injured; for the year 1919, 6495 killed and 52,601 injured. (Mr. Cunningham is quoting Bulletin 74, Interstate Commerce Commission, published in November, 1920, and refers to U. S. A.)

The *World Almanac and Encyclopedia* for 1922 says that in the United States for 1917 there were 1,732,876 railway employees, of whom 3348 were killed and 174,454 injured; 343 passengers were killed and 8374 injured in this year; during the same year, of all others (neither passengers nor employees) 10,087 were killed and 194,805 injured. From the same source we learn that in 1918 in U. S. A. there were 1,841,575 railway employees, of whom 3493 were killed and 156,211 injured; 519 passengers were killed and 8082 injured; of all others 9286 were killed and 174,575 injured. The *Almanac* tells us that in 1919 there were 1,913,422 railway employees, of whom 2271 were killed and 131,211 injured; 301 passengers killed and 8147 injured; of all others 6978 killed and 149,053 injured. In 1920, the last year for which statistics are given, we are informed by the same authority that there were 2,031,927 railway employees, of whom 2667 were killed and 149,602 injured; 264 passengers were killed and 8456 injured; of all others 6958 were killed and 168,308 injured.

Certain railways have in the past been guilty of flagitious mismanagement with its inevitable results, frequent disasters.

The railroad companies are frequently mulcted for large sums of

<sup>1</sup> Vol. xxxii published in 1922, p. 238.



money in damages and after every great accident numerous claims are presented. Bevan speaks of a wreck in which it was alleged that 123 people were injured. In 35 cases distinct claims were made against the railroad, and in 24 of these cases the claims were supported by medical testimony. Sometimes it is eminently proper and right that damages should be awarded. Sometimes the awarding of damages is a ridiculous travesty upon justice. Hodges<sup>1</sup> has told us of the man who, in 1872, because of the diagnosis of "concussion of the spine" as a result of accident and alleged inability to earn his living thereafter, secured a verdict for \$10,000 from the Metropolitan Railroad. In order to celebrate this "legal" victory he proceeded to get intoxicated and when in this state became so strenuous and obstreperous that it required three policemen to escort him to his home. For the remainder of his life he followed the active and laborious calling of junk dealer. Hodges cites another case of fraud. A man received \$18,000 damages from a railway company for alleged impotence following accident and some time thereafter was convicted of bastardy. These railway suits are energetically pushed and obstinately contested. Under the present unfortunate system, each side engages its expert, who, too often, becomes a virulent partisan and too rarely tries to view the case with a calm intelligence. In some cases the injury and its consequences are evident to all. In many cases it is a genuine question whether or not an injury exists. Under the latter circumstances the public is frequently entertained with the spectacle of rival experts examining the same facts, and, although all are sworn to tell the truth, making diametrically opposite statements as to the alleged injury and the degree of disability of the plaintiff. It is important for the expert to be honest and non-partisan, to say truthfully what he thinks, and to know at least something of what he speaks, so that he will avoid doing injustice to an unfortunate who labors under a real disability which may be obscure in its symptoms, and will also avoid doing injustice to a corporation upon the prosperity of which great numbers depend for their support. Not unusually an "old hand" in the witness box who may know very little surgery, but does know how to testify, gets the best of an untrained witness who does know surgery, but does not know how to testify; just as some men play cards too well some men testify too well. A jurymen is no judge of professional ability and neither eminence nor ability is a guarantee of truth.

Railway injuries are of all sorts and of all degrees of severity. In a wreck many passengers escape harm entirely. Some may receive slight injuries, others may be subjected to fearful mutilation, or may suffer rapid or instant death. In some the manifestations of the injury are immediate; in others, they are delayed. In some they are transitory; in others, persistent. In some no secondary troubles follow; in others, secondary consequences of more or less gravity ensue. F. E. Browne<sup>2</sup> removed a spike  $2\frac{1}{2}$  inches in length from the pelvis, behind the bladder,

<sup>1</sup> R. M. Hodges, Boston Med. and Surg. Jour., April 21, 1881.

<sup>2</sup> F. E. Browne, Long Island Med. Jour. (quoted in The Railway Surg. Jour., Aug., 1912).

of a man fifteen years after a railway injury. In some cases injury is asserted when it has no existence, or a real disability is exaggerated, or a disability which existed before the accident is alleged to have resulted from the accident.

It should be borne in mind that even a very serious injury may be recovered from without permanent disability, yet apparently a slight injury may, in some cases, be followed by decided and even permanent disability.

Except for the fact that they are apt to be characterized by more positive and various nervous phenomena many railway injuries differ little, if at all, from injuries due to other causes. The victim of a railway accident may suffer from a variety of injuries, and among many conditions to be considered are: burns, scalds, contusions, wounds, fractures, dislocations, hernia, and perforation or laceration of intra-abdominal, intrapelvic, intrathoracic, intraspinal, or intracranial structures. The causes of railway injuries are numerous. Among the most frequent are those due to derailment or collision.

The high momentum and the great weight of a moving car are capable of inflicting some injuries which are seldom seen from other causes, and many of these cases are obscure and difficult of diagnosis. Further, such injuries are apt to be gravely complicated by the effects of shock, of fright, perhaps of hardship and exposure, and because of these conditions severe and persistent symptoms often arise which may mask or complicate the evidences of real structural damage or which may suggest to the patient the existence of a lesion when no lesion exists. A railway injury, of all injuries, offers to the sufferers the greatest temptations to commit fraud. Tillmanns tells us that in a collision the occupants of the train which is moving most rapidly are the most frequent victims of serious injury. He says that in those who die instantly without outward evidence of injury punctiform hemorrhages about the head and body can often be discovered by a careful examination. Mr. Hill recorded a case of sudden death in which numbers of minute extravasations and some clots existed in the muscles of the abdomen, chest, heart, and also in the brain and viscera. Tillmanns said, further, that the lower extremities are more often injured than the upper, the lungs are not uncommonly, and the abdominal viscera are occasionally injured. The distinguished Leipsic surgeon quoted founded his conclusions largely upon the observations of Tardieu, Erichsen and Page, and the studies of Vipert upon the 400 persons injured in the Charenton accident.

Not unusually after a railroad injury there is great hemorrhage from a surface wound or profuse bleeding into the cavities of the body.<sup>1</sup>

**Causes of Railway Injuries.**—Besides derailment and collision there are many causes, predisposing and immediate, of railway trauma. The railway employee may be in poor physical condition. As Kober<sup>2</sup> tells us, he has a life full of hardships and responsibility. He is ex-

<sup>1</sup> Dr. Hermann Tillmanns, *Principles of Surgery and Surgical Pathology*.

<sup>2</sup> Kober and Hanson's *Diseases of Occupation*, etc., 1916, p. 711.

posed to dust, drafts, etc., and his habits are irregular regarding sleep, work, and meals. Digestive disturbances, respiratory diseases, rheumatism, and affections of the nervous system seem to predominate. Hedinger<sup>1</sup> said that of the German locomotive engineers 8 per cent. only had normal hearing, while 67 per cent. of the engineers and 30 per cent. of the firemen and 14.5 per cent. of the track walkers had defective hearing. Catarrh of the eustachian tube and of the internal ear was the most common affection, due probably to frequent exposure to abrupt changes in temperature. Among the predisposing causes are bad management, great speed, the trust to Providence system, worn-out equipment, very high or very heavy cars, stormy or foggy weather, a personnel mentally or physically incompetent, or dangerously overworked. Color-blindness or impairment in color sense in locomotive engineer or fireman has undoubtedly been responsible for some railway accidents. Stratton<sup>2</sup> tells us of "white" light signals being mistaken for window lamps, etc., and of failure to observe a "distant" or "caution" signal because of impairment in color sense. Edridge-Green<sup>3</sup> states that color-blind men may pass the official wool test and yet be unable to hide their incapacity when examined by the lantern test, and he gives the histories of several instances in which color-blind men have been responsible for accidents on sea and land. Nelson Miles Black<sup>4</sup> advocates the use of glasses by railroad men not only to correct refractive errors but also to protect their eyes against wind, dust, mist, rain, snow, and sleet; to relieve reflection when running beside bodies of water, snow, or sand; to overcome disturbance of vision when running toward the rising or the setting sun and to do away with the heat and glare from the fire-box when the fire-door is open for stoking.

Some of the immediate causes of railway accidents are: coupling or uncoupling of cars (largely reduced as a factor in accidents since the introduction of the automatic coupler); falling off engines or cars; being "side swiped" by a passing car; being caught between buffers; fixing machinery while in motion; falling off or being knocked off the roof of a high box car (greatly reduced as a cause of casualty since the introduction of warning hangers at the approaches to bridges, and the placing of air brakes on freight cars); bursting of boilers; fires in the train; being struck by objects thrown from a passing train, etc. Occasionally an engineer or fireman is thrown violently backward against his seat in the engine cab. Walking on the track, as an employee or as a trespasser, is the most common cause of railway accident. Men are sometimes killed or injured while attending to safety gates at street crossings, while operating switches, and while braking. Every year a

<sup>1</sup> Hedinger, *Ztschr. d. Vereins d. Eisenbahnverwaltg.*, No. 27, p. 25, quoted by Kober and Hanson.

<sup>2</sup> Stratton, *Railway Accidents and the Color Sense*, Pop. Sc. Monthly, March, 1908 (abst. Wood, *Pract. Med. Series*, vol. iii, 1909).

<sup>3</sup> F. W. Edridge-Green, *Lancet*, Sept. 23, 1911 (abst. Wood, *Pract. Med. Series*, vol. iii, 1912).

<sup>4</sup> Nelson Miles Black, *Amer. Jour. of Ophthal.*, Feb., 1906 (abst. Wood, *Pract. Med. Series*, vol. iii, 1907).



number of vagrants are killed while stealing rides and each railway company has an annual list of suicides and attempts at suicide. Occasionally a deaf or blind man attempts to cross a railway track. Kelsey<sup>1</sup> reports the case of a deaf mute who was injured while walking between the rails. It may be difficult or impossible to determine the cause of a railway death. Ensminger<sup>2</sup> cites the case of a brakeman found dead on top of a box car. It was supposed that he had been struck by an overhead bridge, but a postmortem showed rupture of the lung. The bodies of those murdered may be placed across railway tracks. An employee while at his station may die of apoplexy or heart disease, his body fall across the track, and the real cause of his death never be suspected.

The **immediate effects** of an accident may be modified by such factors as:

**Sex.**—More men are injured than women; this is not because men are individually more prone to injury than women, but because more men travel and more men work about railroads. Shock is less manifest in men than in women, but visceral injury is more common because men in middle life are more apt to have visceral diseases than are women. Women suffer much from shock, and after shock are very apt to develop persistent and severe nervous symptoms. The liability to shock will be greatly increased if at the time of the accident a woman happens to be pregnant, menstruating, or lactating. Women stand the loss of blood better than men. Rapid and sudden motion is a frequent cause of premature separation of the placenta and direct violence to the mother may produce abortion or premature labor. There are several cases on record of intra-uterine fracture following trauma to the mother. Children have been born with one, two, or several fractures, the mother during pregnancy having been subjected to violence. Such a fracture may be partially united at birth. Intra-uterine fractures can occur without external violence, being due to amniotic adhesions, syphilis, rickets, osteochondrosis, or parenchymatous osteitis.<sup>3</sup> Rodrigue<sup>4</sup> reported a case of fracture and dislocation in utero and DeLuna<sup>5</sup> had charge of a case of intra-uterine fracture of the clavicle. Trauma to the pregnant mother may result in the delivery of a dead fetus several weeks later, and Gorhan<sup>6</sup> records the birth of a dead fetus two months after the mother had been subjected to violence. When injured, the woman was six months pregnant, and the dead fetus, born two months later, was six months along in development. The fetus had a transverse fracture of both parietal bones. The pregnant woman who is subjected to trauma, shock, or fright may give birth to an idiot.<sup>7</sup> Injuries to the abdomen during pregnancy have also appeared to be causes in some cases of birth palsy.<sup>8</sup> Rupture of a tubal gestation sac may occur after

<sup>1</sup> R. C. Kelsey, *The Railway Surgeon*, May, 1903.

<sup>2</sup> L. A. Ensminger, *The Railway Surg. Jour.*, Sept., 1909.

<sup>3</sup> John B. Roberts and James A. Kelly, *Treatise on Fractures*, 1916.

<sup>4</sup> A. Rodrigue, *Amer. Jour. Med. Sci.*, Phila., 1854, xxvii, 272.

<sup>5</sup> A. B. DeLuna, *Amer. Jour. Med. Sci.*, Phila., 1873, lxvi, 282.

<sup>6</sup> B. C. Hirst, *A Text-book of Obstetrics*, 1918.

<sup>7</sup> Church and Peterson, *Nervous and Mental Diseases*, 1914.

<sup>8</sup> C. S. Potts, *Nervous and Mental Diseases*, 1913.

a blow upon the abdomen, any sudden physical effort, or mental excitement.<sup>1</sup>

Of course, accidents may cause injury to the external genital organs either of the male or of the female. In the female, besides traumatic injuries to the vulva, urethra, vagina, or cervix, external violence may cause rupture of a cystic tumor, twist and strangulation of the pedicle of an ovarian cyst, dislocation of an enlarged ovary, or rupture of a pelvic abscess. Retroversion of the uterus can be produced by traumatism.<sup>2</sup> In the male, rupture of the urethra, contusion of the testicle, burning, scalding or laceration of the penis or scrotum are not unusual concomitants of accidents. Traumatisms of the urethra are much less common in the female than in the male on account of the protected location of the canal. In either sex the ureters occasionally suffer from traumatism, although they are so well protected, and are placed so deeply that injuries are comparatively rare. Injury to the prostate itself is a rare occurrence, but Albarran found one case, cited by Velpeau.<sup>3</sup> Young<sup>4</sup> had a case of fracture of the pelvis in which the prostate was torn off from the urethra. He operated upon it successfully, "but the patient never had erections of the penis afterward." In either sex, of course, the bladder or an intra-abdominal abscess may be ruptured by external violence. Is it possible for atrophy of the testicle to follow severe contusion of that organ? In the severer form of contusion (*i.e.*, that making it necessary to put a patient to bed for one or two weeks) an opinion as to the future integrity of the testicle should not be expressed too confidently. In a certain number of such cases atrophy develops, apparently in spite of any treatment. Atrophy may follow even slight bruises, etc.<sup>5</sup> Keyes<sup>6</sup> states that severe contusion may terminate in atrophy of the testis, abscess or gangrene, and that atrophy may follow a slight injury. Watson and Cunningham<sup>7</sup> state that even slight blows to the testicle, causing but moderate inflammation, may be followed by atrophy. G. G. Smith<sup>8</sup> cites the experimental work of Terrillon and Suchard,<sup>9</sup> whose conclusions were that the severer degrees of traumatic inflammation of the testicle and epididymis were liable to result in atrophy.

**Age.**—Children are profoundly shocked if they suffer from great hemorrhage or severe pain, but otherwise they are not, because they do not have a keen appreciation of the nature of an accident, and the mental effect of the calamity is either absent or is slight and transitory.

<sup>1</sup> B. C. Hirst, *A Text-book of Obstetrics*, 1918.

<sup>2</sup> E. E. Montgomery, *Practical Gynecology*, 4th ed., 1912.

<sup>3</sup> H. H. Young, *Keen's Surgery*, 1910, iv, 382.

<sup>4</sup> *Ibid.*

<sup>5</sup> White and Martin's *Genito-urinary Surgery and Venereal Diseases*, 1917, by E. Martin, B. A. Thomas, and S. W. Moorhead, p. 313.

<sup>6</sup> E. L. Keyes, *Urology*, 1919, p. 577.

<sup>7</sup> Watson and Cunningham's *Diseases and Surgery of the Genito-urinary System*, 1908, i, 230.

<sup>8</sup> G. G. Smith, *Cabot's Modern Urology*, 1918, i, 442.

<sup>9</sup> Terrillon and Suchard, *Arch. de Phys. normale et pathologique*, Paris, 1882, 2 S., ix, 325-335.

Griffith<sup>1</sup> in discussing tuberculous meningitis states that trauma, especially of the head, has seemed to be a predisposing cause in a number of reported instances. "The direct cause is, of course, infection by the tubercle bacillus."<sup>2</sup> The relation between trauma and intussusception has not been established, according to Graham,<sup>3</sup> and the same author gives trauma as a rare cause of perisplenitis.<sup>4</sup> In children, especially in those predisposed by hereditary tendency, a nervous disease may result from shock or fright. Trauma to infants may result in certain forms of epilepsy, in spastic hemiplegia, and spastic diplegia.<sup>5</sup> Young children are very liable to develop epilepsy or idiocy from intracranial hemorrhage. Indeed, Hughlings Jackson maintained that idiopathic epilepsy resulted in most cases from cortical hemorrhage at birth or very early in life.<sup>6</sup> The viscera of a child are seldom injured. This is because they are usually healthy and because the elasticity of their tissues causes the latter to stretch rather than to burst or tear when trauma is applied. The bones of a child are soft and elastic and dislocations or fractures are rarer in children than in adults. "Falls down a whole flight of stairs, in which an adult would surely break several bones, can be sustained by the child often without suffering any damage."<sup>7</sup> A slight depression of a child's skull seldom does harm, because in all probability it will be corrected gradually and spontaneously. The bones of the aged are light and dry as a result of senile osteoporosis and therefore they are easily broken. Cornil<sup>8</sup> in speaking of this senile change in the ribs, states that the bony lamellæ become thinner, and the marrow cavities increase in caliber. This explains the brittleness of the ribs in certain aged persons, as well as the tendency to fracture of the neck of the femur in old people, as pointed out by Humphry.<sup>9</sup> "Old age presents the peculiarities of specific weaknesses of special organs, particularly the circulatory system."<sup>10</sup>

**Obesity.**—A fat person, because of great weight, is apt to be seriously injured by falls; jars, oscillations, or concussions, and he is especially liable to fracture or dislocation. Every fat person is not unhealthy, but many fat persons are. An unhealthy fat person has flabby muscles and relaxed ligaments, and is thus peculiarly liable to sprains, strains, and dislocations. Such an individual suffers severely from shock, has unhealthy viscera which are easily damaged, and after an injury the appetite fails at once, strength is lost rapidly, and wounds do not heal kindly. "Fatty tissue necroses very rapidly, especially if it be injured or constricted, and is frequently the predisposing cause of suppuration. Fat

<sup>1</sup> J. P. Crozer Griffith, *The Diseases of Infants and Children*, 1919, ii, 327.

<sup>2</sup> *Ibid.*

<sup>3</sup> E. E. Graham, *Diseases of Children*, 1916.

<sup>4</sup> *Ibid.*

<sup>5</sup> C. S. Potts, *Nervous and Mental Diseases*, 1913.

<sup>6</sup> W. P. Spratling, *Epilepsy and its Treatment*, 1904.

<sup>7</sup> H. Spitzzy, *The Diseases of Children*, edited by Pfaundler and Schlossmann, 1912, v, 289, translated by C. G. Leo-Wolf.

<sup>8</sup> Cornil, *Societe anatomique*, Paris, Oct. 21, 1904. Cornil and Ranvier's *Histologie pathologique*, Paris, 1869, p. 388.

<sup>9</sup> Sir G. M. Humphry, *Old Age, etc.*, Cambridge, 1889.

<sup>10</sup> J. P. Warbasse, *Surgical Treatment*, 1918, vol. i.



embolism also is more apt to occur in these patients."<sup>1</sup> The obese are prone to fatty hearts.

**Habits.**—When alcoholism complicates injury, it may delay or prevent recovery because of the existence of insomnia or the development of delirium tremens. Its effects may be limited to slight restlessness or it may induce violent delirium tremens. Crile<sup>2</sup> contradicts the common view that Providence protects drunken men. He says that "In deep alcoholism muscular tone is greatly reduced, and in this state the viscera are sometimes subjected to serious trauma. The muscular tone of the abdomen and lower thorax is such as to protect the heart fairly well against mechanical violence." In deep alcoholic collapse death may result from blows or from encountering corners of tables, etc. After an accident the alcoholic's appetite, none too good hitherto, fails completely. His kidneys often strike work, delirium tremens may ensue or both conditions may develop. If a fracture exists, the muscular tremors of delirium tend to separate the ends of the fragments and non-union or faulty union may result—if the patient be so fortunate as to survive. In an alcoholic, after a slight accident, we have noted, more than once, the following sequence of events: delirium tremens, uremia or pneumonia, death. An alcoholic is an extremely bad subject. In him, after an accident or after an operation, infection is particularly apt to take place and sleeplessness is inevitable and exhausting.

Mme. Athanassio Benisty<sup>3</sup> believes that alcoholism may be a factor opposing regeneration following nerve suture. In alcoholic drunkards, opium habitués, tea inebriates, and insane individuals (especially paretics) wide-spread ecchymosis may be caused by a very trivial injury. The same may be said of hemophiliacs or of individuals who are anemic from any cause. Patients who are victims of drug habits, as well as the families of those so afflicted, will often conceal the real state of affairs, and thereby both obscure the diagnosis and misdirect the treatment. Drug addicts are decidedly poor patients, and stand accidents very badly.

**Temperament.**—In estimating the gravity of an injury, and the possible duration of the effects of such an injury, temperament does not play its former influential rôle. Increased knowledge of infection and antisepsis, shock, and the causes of death, as well as occasional seer-like soarings and more frequent flights of erratic fancy into the speculative realm of endocrinology have suggested to the modern surgeon that perhaps the influence of temperament on the outcome of trauma has been exaggerated. That there is, however, such a factor as temperament and that it does at times exert some inexplicable influence on results no surgeon of extensive operative experience will be apt to deny. Every surgeon in hospital practice has noticed that the patient who is cheerful and hopeful is most apt to survive a bloody and extended operation,

<sup>1</sup> J. H. Gibbon, *Keen's Surgery*, 1910, v, 619.

<sup>2</sup> G. W. Crile, *Keen's Surgery*, 1910, i, 90.

<sup>3</sup> Mme. Athanassio Benisty, *Treatment and Repair of Nerve Lesions*, in *Medical and Surgical Therapy* (Amer. ed., 1918, by Keogh), ii, 317.

while the patient who is gloomy or terrified is most liable to succumb to even a trivial intervention. Indeed, such recent authors as Crile and Lower<sup>1</sup> state that "the patient who, prior to his operation is convinced that he will die, usually does die." This factor underlying the patient's psychical and physical behavior toward present, past, or impending trauma—this factor, whatever it may be, is what we call temperament.

**Race.**—Jews, especially Russian Jews, often become frantic with terror after an accident and develop many secondary nervous phenomena. Negroes suffer considerably from fear, being usually very emotional. Warbasse<sup>2</sup> reminds us that the negro, as seen in temperate climates, is less resistant to disease and injury than are the whites, and the death-rate among them is higher at all ages. The same author cautions us to bear in mind that the skull of the African negro is much thicker than that of the white. He says that mulattoes or mixed breeds present the weaknesses of both races and more deficient resistance than either. Warbasse<sup>3</sup> also states that the Jewish people bear surgical operations well; and that injuries and operations are borne particularly well by the people who live exclusively, or nearly so, on a vegetable diet—the Chinese, Japanese, Indians, Mohammedans, and the peasantry of Europe. Matas<sup>4</sup> tells us that, while traumatic aneurysms may result from an injury done to a healthy or normal artery, more often, traumatism or injury only determines the localization of an aneurism in arteries already diseased. In the light of this statement, Camack's analysis (quoted by Rodman<sup>5</sup>) of 3954 necropsies would have a bearing upon the question of the influence of trauma on arteries. Camack found that aneurysm was three or four times as common in negroes as in whites.

## SHOCK

Shock is a condition frequently encountered in railway accidents. "Shock is a general depression of the vital powers arising from an injury or a profound emotion."<sup>6</sup> Numerous are the theories as to the causation and essential nature of shock. They have been most ably reviewed by Seelig.<sup>7</sup> We have not space to discuss them. Certain it is that no theory is entirely satisfactory. Crile and Lower<sup>8</sup> deprecate the use of the word "shock" as loose and unscientific, and would substitute the term "exhaustion." The histologic changes in the brain, the liver, and the adrenals may be caused by emotion alone, by physical injury alone, by hemorrhage alone, by starvation alone, by insomnia alone, by adrenalectomy, by excessive adrenal injection, by excessive thyroid

<sup>1</sup> G. W. Crile, and W. E. Lower, *Surgical Shock*, 1920.

<sup>2</sup> J. P. Warbasse, *Surgical Treatment*, 1918, vol. i.

<sup>3</sup> *Ibid.*

<sup>4</sup> R. Matas, *Keen's Surgery*, 1910, v, 218.

<sup>5</sup> W. L. Rodman, *Keen's Surgery*, 1910, iv, 1140.

<sup>6</sup> J. Chalmers DaCosta, *Modern Surgery*, 8th ed., 1919.

<sup>7</sup> G. Seelig, *Internat. abstract of Surg.*, Feb., 1914.

<sup>8</sup> G. W. Crile and W. E. Lower, *Surgical Shock and the Shockless Operation Through Anoci Association*, 1920.

feeding, by the injection of acids, etc., or these changes may be initiated by emotion, carried a step further by muscular exertion, another step by physical injury, another by hemorrhage, and so on until many brain cells are destroyed; or by all these factors acting simultaneously may produce the same disastrous results. They say that the microscopic changes in shock and in exhaustion from any cause whatsoever seem to be identical. "In the mechanism of death from shock there is no factor which distinguishes that death from many other causes." These investigators<sup>1</sup> state that the obvious phenomena of shock are: 1, Reduced metabolism; 2, Loss of body heat; 3, Loss of muscular power; 4, Loss of mental power; 5, Increased respiratory rate—increased ventilation of the lungs; 6, Increased pulse-rate; 7, Lowered arterial blood-pressure; 8, Cold, moist skin; 9, Pallor—sometimes a yellowish tint; 10, Shrunken facies; 11, Cyanotic nails; 12, Dull, listless, expressionless eyes, with heavy lids; 13, Increased H-ion concentration of the blood—diminished reserve alkalinity; 14, Concentration of the blood—relatively high red blood count. "The cytologic changes characteristic of shock and exhaustion, however caused, we believe to be due to intracellular acidosis. Intracellular acidosis interferes with intracellular respiration, which is life itself." DaCosta<sup>2</sup> states that "In shock the abdominal veins are greatly distended and the other veins of the body may also be overfull, the arteries contain less blood than normal, and an insufficient amount of blood is sent to the heart and to the vital centers in the brain. In other words, in shock there is a deficiency in the circulating blood. In grave shock so much blood is imprisoned in the splanchnic area that the patient may be regarded as bleeding to death in his viscera. The term *collapse* is used by some to designate a severe condition of shock, and is employed by others as a name for a condition produced by functional depression of the vasomotor center, the result of mental disturbance, cardiac failure, respiratory failure, or vasomotor insufficiency, rather than of physical injury. As a matter of fact, shock and collapse are often both present. Shock may be slight and transient, it may be severe and prolonged; it is usually sudden in onset, but may come on gradually, and it may even produce almost instant death." Even a violent injury does not of necessity at once produce shock. "Every now and then we see a man with a crushed limb who does not exhibit shock, the condition gradually coming on from pain, terror, etc., and being aggravated perhaps by hemorrhage. The onset of shock may be delayed for half an hour or an hour. If the victim of a railway accident is greatly excited he may actually move about for quite a time before passing into shock."<sup>3</sup> "If shock appears after a decided delay the surgeon should always suspect and examine for concealed hemorrhage. What surgeons used to call *secondary shock*, that is, deep shock arising twenty-four hours or more after an operation or injury, is probably due either to acute sepsis

<sup>1</sup>G. W. Crile and W. E. Lower, *Surgical Shock and the Shockless Operation Through Anoci Association*, 1920.

<sup>2</sup>J. Chalmers DaCosta, *Modern Surgery*, 8th ed., 1919.

<sup>3</sup>*Ibid.*



or to hemorrhage. Fat embolism may be mistaken for shock. During an operation if shock arises, it is apt to do so gradually, but this is not always the case, for sometimes it comes on with great suddenness, as when the bone of the thigh is sawed through, or where there is a burst of blood from a large vessel. Sudden death from what is usually called shock is probably due to reflex stimulation of the pneumogastric nuclei and arrest of cardiac action. It is known as death *by inhibition*.<sup>1</sup>

Death from inhibition may be caused by a blow upon the point of the chin, upon the testicle, upon the larynx, over the solar plexus, or over the heart. Death by inhibition may "occur during intralaryngeal operations or manipulations, and during general anesthesia. Sudden death from terror or from the reception of ill news is probably caused in the same way. Shock is more severe in women than in men, in the nervous and sanguine than in the lymphatic, in those weakened by suffering than in those who are strangers to illness. Disease of the kidneys, diabetes, chronic cardiac disease, and alcoholism predispose to it. Fear is probably a great factor. Injuries of nerves, of the intra-abdominal viscera, of the urethra, or of the testicle produce extreme shock; so do crushes and compound fractures of the extremities, and the nearer to the body the injury is, the greater is the shock. Archibald and McLean state that on the battle front it has been found that chest wounds and head wounds seldom produce severe shock, an observation not in accord with older writings on injuries in civil life. Anything which extracts the body heat favors the development of shock (exposure to cold air, insufficient covering, chilling of the body by solutions or wet towels). Those who are cold, wet, fatigued, and hungry are predisposed. Prolonged and rough transportation adds to the gravity of shock. In cerebral concussion there is shock plus other conditions. Sudden and profuse hemorrhage greatly aggravates, and prolonged anesthetization causes shock."<sup>2</sup> "Shock is not rarely followed by suppression of urine. Whereas the victim of shock is usually stupid and indifferent, he may become delirious. If delirium arises, the condition is very grave. Travers called shock with delirium *erethistic* or *delirious shock*. As a matter of fact, such a state is not genuine shock, but is either a traumatic or a toxic delirium due to uremia or sepsis. Delirious shock may arise after a person has been bitten by a poisonous snake. Many years ago Travers described a *delayed shock*, which comes on several hours after an injury or violent emotional disturbance. This form of shock is seen not unusually in those who have passed through a railway accident. It may be a sign of hemorrhage or an evidence of acute sepsis, and is sometimes met with after the administration of ether or chloroform. Fat embolism may be mistaken for it. *The statements made by a person who has recovered from a severe shock are always unreliable as to events which occurred while shock existed, and are often doubtful as to the details of the accident, not unusually the memory of the accident is perverted or even destroyed.*"<sup>3</sup>

<sup>1</sup> J. Chalmers DaCosta, *Modern Surgery*, 8th ed., 1919.

<sup>2</sup> *Ibid.*

<sup>3</sup> *Ibid.*

**Delirium tremens** has been quite common in drunkards or even in "regular drinkers" who have been victims of railway accidents. Forgue and Jeanbrau<sup>1</sup> quote Friedrich as saying that in a total of 11,926 accidents he found 215 cases of delirium tremens with a mortality of 19 per cent.; and they also cite Billroth as stating: "Among the patients attacked with acute delirium tremens whom I have treated at least half of them died." The late Roswell Park,<sup>2</sup> in discussing delirium tremens, said: "It is precipitated in many cases, where otherwise it would simply remain imminent, by surgical injuries and operations." Eisendrath,<sup>3</sup> in discussing the complications of fractures, believes that the sudden onset of delirium tremens is quite rare and that it begins gradually in most cases.

**Traumatic delirium** is a state of febrile delirious excitement occasionally observed in the victims of an accident. If hallucinations of vision, muscular twitchings, restlessness, muttering delirium, and a rapid pulse occur after a fracture in persons who are not alcoholic, the condition is known as a simple or traumatic delirium. "It is most apt to occur in children and in elderly persons."<sup>4</sup> Its etiology is not quite clear. If these symptoms endure more than a few hours after an injury, and we can exclude such causes as loss of blood, septic infection, anuria, acetoneuria, iodoform absorption, or senile atrophy of the brain of the aged—the case may be considered one of true nervous traumatic delirium."<sup>5</sup> Roberts and Kelly<sup>6</sup> state that in traumatic delirium "the patient's attention can at times be fixed, only to be quickly lost; the events of the past are recalled, and the subject causing mental anxiety is uppermost in the patient's mind."

## TRAUMATIC NEUROSES

**Traumatic Hysteria; Traumatic Neurasthenia; Traumatic Insanity.**—(See next section.) Any or several of these conditions may follow a railway accident. Autosuggestion or simulation may be a factor. There may or may not be an organic lesion present. Allbutt<sup>7</sup> witnessed many attacks of hystero-epilepsy in a young woman who had been shaken and very much alarmed in a railway accident. "Suggestibility is a leading feature and the differentiation of hysteria and traumatic neurosis is in many cases impossible" (Elsner<sup>8</sup>). Dickens was subject to attacks of "suggestion" hysteria following his railway accident in which he was not hurt, although the car which he occupied hung over the edge of a chasm for a time. He never recovered from the mental shock, and his daughter tells us that thereafter when travel-

<sup>1</sup> E. Forgue and E. Jeanbrau, *Presse Medicale*, translated in *The Railway Surgical Journal*, Sept., 1910.

<sup>2</sup> Roswell Park, *The Principles and Practice of Modern Surgery*, 1907, p. 174.

<sup>3</sup> D. N. Eisendrath, *Keen's Surgery*, 1910, ii, 103.

<sup>4</sup> *Ibid.*

<sup>5</sup> *Ibid.*

<sup>6</sup> J. B. Roberts and J. A. Kelly, *Treatise on Fractures*, 1916, p. 37.

<sup>7</sup> Clifford Allbutt, *Allbutt and Rolleston's System of Medicine*, 1910, viii, 764.

<sup>8</sup> H. L. Elsner, *Monographic Medicine*, 1916, vi, 1021-1024.

ing by rail, "he would often suddenly fall into a paroxysm of fear, clutch the arms of the railway carriage, large beads of perspiration standing on his face, and suffer agonies of terror."<sup>1</sup> In honest cases of traumatic neurosis there is often found an inherent weakness of the will and a neuropathic predisposition often inherited.<sup>2</sup> Very few, if any, examiners now follow Erichsen, who, without regard to the absence of signs of external violence, ascribed a host of lesions to railway accidents. Page's<sup>3</sup> clean-cut observations did not substantiate Erichsen's views. Of course, actual injury may exist in addition to neurasthenia, hysteria, or hysterо-neurasthenia, and there may be injuries of large blood-vessels and various viscera as well as of tendons, muscles, ligaments, or bones. Dercum<sup>4</sup> cites the case of a man who had been struck at a railroad crossing, tossed several feet, and bruised severely. Afterward he developed a typical neurasthenic syndrome, and fifteen months after the accident died suddenly. Autopsy showed that death was due to the rupture of a thoracic aneurysm which was unsuspected during life. Organic affections should be searched for carefully in spite of the presence of neurasthenia or hysteria. Elsner<sup>5</sup> says that "when Graves' disease or other organic nervous or cardiovascular changes follow traumatic neurosis, it is likely that these diseases would have developed without the trauma." C. H. Mayo<sup>6</sup> does not believe that shock or fright causes hypersecretion of the thyroid. He believes that the hypersecretion existed before, but that there were no symptoms because the body had been neutralizing the poison and the shock developed the symptoms by abolishing neutralization. Barker<sup>7</sup> says that the symptoms of traumatic neuroses are very variable and that it is sometimes difficult to decide in how far the sensory, motor, and reflex symptoms are organic, and in how far "psychogenic" in origin. The same author states that traumatic neuroses are to be differentiated from simulation, hematomyelia, caries of the spine, and brain abscess. Barker appends a splendid bibliography of the subject. Dercum<sup>8</sup> maintains emphatically that trauma, such as produces traumatic neurasthenia or traumatic hysteria, never leads to mental disease; that a history of trauma associated with the developmental period of melancholia or mania is excessively rare, and in no case in his knowledge has trauma borne an etiologic relation to the affections named; that trauma is not even an exciting cause. He further states that melancholia and mania (the manic-depressive group) are affections dependent upon an essential neuropathy; that they are nervous affections possessing an intimate pathology of their own, and bear no relation whatever to

<sup>1</sup> Clifford Allbutt, Allbutt and Rolleston's System of Medicine, 1910, viii, 764.

<sup>2</sup> H. L. Elsner, Monographic Medicine, 1916, vi, 1021-1024.

<sup>3</sup> Herbert W. Page, Injuries of the Spine and Nervous Shock, 2d ed., 1885, and Railway Injuries, 1891.

<sup>4</sup> F. X. Dercum, Keen's Surgery, 1910, ii, 779.

<sup>5</sup> H. L. Elsner, loc. cit.

<sup>6</sup> C. H. Mayo, Illinois Med. Jour., Feb., 1913.

<sup>7</sup> L. F. Barker, Monographic Medicine, 1916, iv, 596.

<sup>8</sup> F. X. Dercum, loc. cit.



trauma. Now and then a patient will become dazed, delirious, or confused as the immediate result of the fright or shock of an accident, but these disturbances are very short in duration and persistent delirium or confusion following fright is excessively rare. Dercum asserts that when mental symptoms follow slight traumata of the head it is a justifiable inference that a hereditary or acquired predisposition to mental disease has existed; and that even such cases are very rare. This would explain cases of paresis following and occasionally ascribed to trauma of the head. Dercum is at odds with some other authorities who maintain that trauma is a not very uncommon exciting cause of mental disease in the predisposed.

## INJURIES OF THE BACK

Injury of the back is very frequently alleged as the basis of a claim for damages. Undoubtedly injuries of the back are frequently produced by railway accidents, and as they are apt to be complicated by nervous symptoms, they constitute a great source of litigation, doubt, error, and fraud. These injuries may be produced by direct blows upon the back, violent oscillations of the body, propulsion forward or throwing backward, bending, thrusting, lifting, violent jars, or jumping from the train. Such injuries may be intraspinal, extraspinal, or a combination of both forms. In many cases of back injury the damage is confined to ligaments and muscles and absolutely unassociated with injury of bones or nervous structure. Crile<sup>1</sup> has called attention to the importance that a hemorrhage beneath the deep fascia of the back may assume. One of us (Jones) recently had charge of a case (injured by a street car) in which hemorrhage had been slowly dissecting its way under the fascia for three weeks before the area was incised and evacuated. The blood of this patient had a coagulation time of nine and a half minutes. Occasionally an apparently trivial injury to the back has been followed by a grave cord lesion. Injuries to the back may be responsible for pathologic conditions ranging in severity from contusion limited to the skin and superficial soft structures to fracture or dislocation of vertebræ perhaps with cord injury or even a complete crush of the cord. As a result of a railway accident the patient may suffer from contusion or laceration of the muscles or tendons of the back, or of the joint-capsules and ligaments of the spine; he may have vertebral contusion or contusion of intervertebral disks.<sup>2</sup> Such injury may result in a compression fracture of the vertebral body without any marked cord lesion—a fracture which, according to Kocher,<sup>3</sup> is frequently associated with fracture of the sternum opposite the second rib. Injury to the back may cause hemorrhage within the spinal canal (hematorachis, usually due to rupture of venous plexuses) and Frazier<sup>4</sup> says that "There are

<sup>1</sup> G. W. Crile, *Keen's Surgery*, 1910, i, 920.

<sup>2</sup> T. Kocher, Quoted by W. Trotter and G. Williams in C. C. Choyce's *A System of Surgery*, iii, 427, 428.

<sup>3</sup> *Ibid.*

<sup>4</sup> C. H. Frazier, *Surgery of the Spine and Spinal Cord*, 1918.



numerous cases, both clinical and experimental, which prove beyond doubt that impact to the spinal column without fracture of the vertebræ is capable of producing hemorrhage within the cord substance" (hematomyelia). As a result of trauma to the back the vertebræ may be fractured, dislocated, or may suffer isolated fracture—dislocation or isolated fractures (of the bodies, arches, transverse processes, spinous processes, or articular processes). Fracture or dislocation of the spine may contuse, lacerate, completely crush, or sever the spinal cord. If the back be injured below the level of the second lumbar vertebra the cord will escape damage, but the cauda equina may become involved, with very serious results to the patient. Injury to the back may be followed by myelitis acute or chronic.

After an injury to the back there may be fracture or dislocation of the vertebræ without cord lesion, or cord lesion without fracture or dislocation of the vertebræ. Concussion of the spinal cord the result of Erichsen's "molecular disturbance" has no definite pathologic meaning, and, if there be such a condition, it is probably associated with laceration of capillaries and of cord substance. Frazier<sup>1</sup> suggests that advancement in histologic technic may perhaps furnish us with some organic basis for this molecular disturbance. We must bear in mind, however, that the presence of hysteria or any of the other traumatic neuroses is not incompatible with the existence of a gross lesion; hence, our examination must be thorough and painstaking. The increased reflexes of a functional condition are exhausted much more readily than the increased reflexes due to organic cord disease. Injury to the back may stir into activity latent tuberculosis of the spine, syringomyelia or chronic arthritis of the spine such as often follows injury to other joints. Kummell's disease or traumatic spondylitis (first described by Schede and later by Kummell,<sup>2</sup> which is preceded by trauma, is probably tuberculosis of the spine. Acute osteomyelitis of the spine may follow injury to the back. Injury to the back may be followed by muscular wasting, chronic vertebral osteomyelitis, or periosteal sarcoma. It is manifestly impossible to take up in detail the signs and symptoms of all the injuries of the back in this chapter, but there are a few suggestions which may be helpful to the railway surgeon and which we shall mention casually. In considering injuries of the back it is well to remember that the cervical region suffers most often and the dorsal region least often, but in some cases two or more regions are involved simultaneously. Symptoms may arise promptly and be marked and positive, but often they come on gradually and are at first trivial and uncertain. Sometimes two or three days may pass before the symptoms are positive or even disabling. If doubtful whether tenderness is real or simulated make pressure upon it and count the pulse. Pressure which causes pain increases the pulse-rate (Mannkopf's test). In a bad sprain of the back the pain on movement may be so severe that the patient dreads the very thought of motion, and his refusal to move may be mistaken for paralysis.

<sup>1</sup> C. H. Frazier, *Surgery of the Spine and Spinal Cord*, 1918.

<sup>2</sup> G. Woolsey, *Keen's Surgery*, 1910, ii, 879.

In attempting to elicit rigidity of the back, remember that unilateral rigidity may exist and cannot be simulated. Limitation of movement in the cervical region can be detected by asking the individual to turn his chin far over one shoulder and then far over the other shoulder. Then have him sit in a chair, look at the ceiling, and throw his head farther and farther back. Rigidity in the thoracic region is hard to make out. In the lumbar region rigidity can be detected by undressing the patient, placing him face down, and observing the lumbar curve while a leg or the body is raised. Before deciding that injury to the back is purely musculoligamentous, examine thoroughly for a lesion of bone or nerve structure; for spinal hemorrhage, compression of the cord or damage to nerve-roots. The surgeon should test for paralyses or muscle weaknesses, examine the reflexes (remembering that not all of the skin reflexes are always present in normal people and that absence of deep reflexes may be caused by such mechanical reasons as ankylosis of joints or excessive spasticity of muscles<sup>1</sup>), test for spasticity or flaccidity or atrophy, and examine muscles for the electric reactions of degeneration. It may be proper to examine the cerebrospinal fluid. Kolmer<sup>2</sup> states that "In sprains, dislocations, contusions, and other injuries without actual laceration or injury to the arachnoid and pia mater the cerebrospinal fluid shows practically no departure from the normal." Always have an injured back examined by an expert roentgenologist. "Fractures of the spine should be studied if possible from both an antero-posterior direction and in a lateral direction. A lateral view of the spine cannot always be made satisfactorily, especially in very stout or muscular men, but, by the use of intensifying screens and careful technique practically all can be demonstrated, and many fractures that were previously overlooked because they gave no characteristic symptoms of fracture are now clearly demonstrable in the Roentgen rays."<sup>3</sup>

Immediately after any severe back injury the reflexes may be lost temporarily from shock, and temporarily, due to the same reason, the patient may have symptoms of complete interruption of (functional) continuity of the spinal cord, and at this time (an hour or so after the accident) it may be impossible to tell whether the patient has a complete transverse lesion of the cord or not.<sup>4</sup> If later the Brown-Séquard syndrome be noted, it is evidence that the cord had not been completely destroyed.<sup>5</sup> The reader will recall that the Brown-Séquard syndrome consists of paralysis of a limb or the side of the body on the same side as the cord lesion and anesthesia of the opposite side, on the side of the lesion the reflexes being increased. If there should be any sensation or power or movement in parts below the lesion, there has not been complete destruction of the cord. This is also the conclusion if the tendon-jerks return inside of a week. "If they do not return within this time, provided the lesion does not involve the segments which con-

<sup>1</sup> M. H. Fussell, *Monographic Medicine*, 1916, v, 588, 589.

<sup>2</sup> J. A. Kolmer, *Frazier's Surgery of the Spine and Spinal Cord*, 1918, p. 205.

<sup>3</sup> G. A. Pfahler, *DaCosta's Modern Surgery*, 8th ed., 1919, p. 1610.

<sup>4</sup> C. H. Frazier, *Surgery of the Spine and Spinal Cord*, 1918.

<sup>5</sup> Church and Peterson, *Nervous and Mental Diseases*, 1913.

trol the reflex, it is evidence of complete destruction."<sup>1</sup> Dejerine<sup>2</sup> found preservation of the *cutaneous reflexes* in the human being after a complete lesion of the spinal cord. After injury to the back it may be difficult to make a differential diagnosis between a surgical lesion and a traumatic neurosis, such as hysteria; and we should remember that the patient may have both conditions. Rust<sup>3</sup> described a case in which a hysteric patient three times simulated successfully myelitis following a fall on the spine. Every known method of examination should be exhausted before making a diagnosis of malingering. We recall the case of a man who was carried into one of the hospitals with which we are connected claiming that there was paralysis of both of his legs. He stated that he had just fallen a distance of 2 feet, striking his spine upon an asphalt street. Eight physicians, after examining him, agreed that he was a malingerer. Several weeks later he died and a necropsy revealed transverse myelitis.

## INJURIES OF THE HEAD

Injuries of the head may vary in gravity from a trivial wound or a simple contusion of the scalp to fatal compression of the brain. Fractures of the skull arising from railway accidents do not differ in any particular from fractures sustained under other circumstances. A hematoma of the scalp beneath the periosteum may be confused with a depressed fracture. The differentiation may be made if it be remembered that the edges of a hematoma are above the level of surrounding bone and the edges of a fracture are not; the center of a hematoma can be compressed and the solid bone be felt beneath it, and the bone felt is on a level with the general bony contour. The edges of a fracture are on a level with the surrounding bone and if pressure is made upon the depressed area the finger sinks below the general level of the bone. A hematoma above the aponeurosis of the occipitofrontalis muscle moves with the scalp above the bone. A bone of the skull can be contused without being fractured, this condition sometimes being followed by necrosis. In a young child a portion of the bone may be depressed without fracture, a condition which is rarely permanent unless it is marked. Cerebral pressure usually elevates a moderate depression. The softness of an area of craniotabes or an open fontanel must not be confused with the fixed depression of a fracture or a bending. For the signs of fracture of the vault and base of the skull the reader should consult a standard work upon surgery. In any head injury where there is a question of possible intracranial mischief, lumbar puncture should be performed in order to measure the pressure of the cerebrospinal fluid with a spinal mercurial manometer (normal pressure is 6 to 8 mm. Hg.)

<sup>1</sup> Church and Peterson *Nervous and Mental Diseases*, 1913.

<sup>2</sup> J. Dejerine, *Sémiologie des affections du système nerveux*. Deuxième Edition, 1914 (quoted by A. R. Allen, in *Frazier's Surgery of the Spine and Spinal Cord*, 1918).

<sup>3</sup> Rust, *Aerztl. Sachverst.-Zeitung*, 1908, No. 15, p. 310 (cited by Dercum in *Keen's Surgery*, vol. vi).



and to note the presence or absence of blood. Ophthalmoscopic examination should be made at six- to twelve-hour intervals in order to discover the earliest signs of edematous blurring of the disks.<sup>1</sup> An x-ray examination should be conducted as promptly as possible—aided by stereoscopic plates. A compound fracture of the skull may rupture a sinus. In some cases even an extensive fracture is associated with very slight brain trouble; in other cases a mere fissure fracture is associated with evidence of grave intracranial mischief. In head injuries causing fracture the mere solution of continuity in one or more cranial bones is of secondary importance when compared with the accompanying brain injury. The skull is a sort of carapace or coat. A carapace may be cracked without injuring the turtle. A coat may be torn without injuring a man. The really important thing is not the extent of skull injury but is the degree and nature of brain injury. A fracture of the skull can be associated with or followed by meningeal hemorrhage, cranial pneumatocele, spurious meningocoele, compression of the brain, abscess of the brain, meningitis, phlebitis of the diploë, sinus thrombosis, necrosis, or osteomyelitis of the skull. The force which causes a fracture invariably causes concussion of greater or less severity.

**Intracranial Hemorrhage.**—Even the most casual discussion of railway injuries must include a consideration of traumatic intracranial hemorrhage—so frequently do employees or passengers of a railway suffer from extradural, subdural, or cerebral hemorrhage. Hemorrhage occurring between the cranium and the dura is usually from the middle meningeal artery or from one of its branches. In other words, it is usually extradural meningeal hemorrhage. Extradural hemorrhage, however, may be due to the rupture of a venous sinus or to the penetration of such a sinus by a spicule of a fractured cranial bone. Occasionally rupture of the middle meningeal artery occurs without fracture of a cranial bone. For the details of the symptomatology of extradural hemorrhage the reader is referred to any text-book on surgery. Suffice it here to remind the railway surgeon of a few salient facts which may be helpful to him in the recognition of head cases. The location of the head injury does not give us such information that we can with certainty diagnose the side of the intracranial mischief. It is well known that rupture of the middle meningeal artery may occur on the side opposite to that on which the trauma was received. Paralysis, if it arises, is on the side opposite to the blood-clot. The clot may or may not be on the side to which the force was applied. (The artery may rupture by contrecoup on the side opposite to that on which the trauma was inflicted.) The coma which arises in meningeal hemorrhage is caused by the accumulation and clotting of blood between the cranium and the dura. The coma has been preceded by a brief or long but always a distinct period of consciousness; which, in its turn, may or may not have been antedated by a short period of unconsciousness immediately following the application of the trauma. Whether or not there be this last mentioned initial unconsciousness, following an accident which causes extradural

<sup>1</sup> W. Sharpe, *International Clinics*, 29th Series, 1919, iv, 249.

hemorrhage, there will be a distinct period of consciousness the duration of which will depend upon the caliber of the vessel ruptured. If a sinus be ruptured, this period of consciousness will be a matter of minutes or even seconds; if a small branch of the meningeal artery be severed, this period of consciousness may endure for a day or even much longer. Sooner or later, however, a clot will become large enough to compress the cerebral cortex and then will ensue an unconsciousness final and lethal—unless this compression be relieved by the surgeon. In these cases the cerebrospinal fluid, obtained by lumbar puncture, will be clear, unless there is also hemorrhage into the subarachnoid space. An early ophthalmoscopic examination should be made and we should seek promptly the aid of the roentgenologist who, with stereoscopic plates, can tell us whether or not there is fracture of the skull.

Subdural meningeal hemorrhage is due to depressed fracture, rupture of the middle cerebral artery, or of a number of small vessels. The symptoms are identical with those of extradural hemorrhage except that they are usually rapid in onset and accompanied by a more distinct drop in temperature and graver depression. Headache preceding unconsciousness is more violent than it is in extradural hemorrhage. Lumbar puncture usually discloses a bloody cerebrospinal fluid, but the cerebrospinal fluid thus obtained *may be clear* if the blood has not had time to diffuse widely or if it has clotted rapidly. Pressure is diagnosed early by means of the ophthalmoscope.

The symptoms of intracerebral hemorrhage are identical with those of apoplexy.

**Concussion of the Brain.**—Keen says that there may be slight brain injuries which can properly be called “concussions,” but it is better to consider concussion as synonymous with laceration of the brain. DaCosta<sup>1</sup> holds, with von Bergmann, that it is not repeated waves of force from the blow, but the concussion of the blow itself that does the harm; that the brain is momentarily displaced by the blow; that the blow acts on the entire brain; that the centers are first stimulated (as when a man “sees stars” after a blow) and then depressed (heaviness, dulness, stupor, perhaps unconsciousness, and in fatal cases are not only depressed but are paralyzed). How long may concussion last? As von Bergmann well says: “Concussion is transient in its manifestations. It is a matter of a few minutes or, at most, a few hours, and any prolongation of severe symptoms beyond this time, especially if they are intensifying as time goes on, indicates an associated injury.”<sup>2</sup>

Without going into a lengthy discussion on concussion, compression, and contusion of the brain (the reader is referred to a text-book on surgery) we might sum up the situation in the apposite words of Cushing,<sup>3</sup> who says: “The three conditions shade so imperceptibly that it is often difficult to determine where true concussion ends and symptoms of contusion begin; and likewise where symptoms of contusion end and

<sup>1</sup>J. Chalmers DaCosta, *Modern Surgery*, 8th ed., 1919.

<sup>2</sup>*Ibid.*

<sup>3</sup>H. Cushing, *Keen's Surgery*, 1910, iii, 182.

those of compression begin." Sharpe,<sup>1</sup> in a series of 600 acute brain injuries in adults, noted a marked increase of the intracranial pressure in only 30 per cent., and on these only did he operate. The total mortality was 28 per cent. or, excluding those cases moribund when admitted to the hospital, 19 per cent.

"Recovery from concussion may be complete and permanent, but, on the contrary, the entire nature may undergo a change. Such a change, which may not be evident for weeks or months, is apt to be manifested by egotism, selfishness, censoriousness, mendacity, great irritability, outbreaks of violent rage about trivial things, and forgetfulness. The forgetfulness is particularly as to recent events."

"There are headaches, insomnia, attacks of depression, lassitude, and vertigo. Such a patient is very susceptible to alcohol, the heat of the sun, and physical or mental strain. He can do nothing requiring mental effort."

"After concussion a patient may develop hysteria, epilepsy, amnesia, or actual insanity. A condition resembling Korsakow's psychosis may develop (a condition of confusion with gaps in memory which are filled up spontaneously by fabrications, the patient also having multiple neuritis), confusional insanity, or mania may arise, or a condition like hallucinatory paranoia or mental weakness, which may resemble paresis. Concussion may pervert or wipe out all memory of the causative accident and also, strange to say, of a varying period preceding the accident. The loss of memory of the accident is permanent; the amnesia for a period preceding the accident may be permanent or may only be temporary."<sup>2</sup>

In one case of concussion a railroad engineer passed into a state of perfect and mental blankness, wandered off, and was lost for months. When found he did not know his own name, where he came from, where he lived, that he was married and had children, or anything about himself before or after the accident. He made a partial recovery. He came to remember that he had been an engineer, was married and had a family, in fact, most of his life up to some years before the accident. The gap in memory was never filled entirely.

"Statements made regarding an accident by one who has had concussion must be received with many grains of salt. A man may tell a story he believes himself, and yet it may be a mass of dream fancies without a word or with scarcely a word of truth. Victims of arterio-sclerosis are particularly apt to develop mental trouble and neurasthenia."<sup>3</sup>

After concussion or other head injury so-called traumatic diabetes or traumatic polyuria may occur. Polyuria is probably due to some injury of the pituitary gland. Diabetes results from stimulation of the adrenals by irritation of the splanchnics. Traumatic diabetes is a temporary condition. A brain tumor may develop as the direct result

<sup>1</sup> W. Sharpe. *International Clinics*, 29th Series, 1919, iv, 249.

<sup>2</sup> J. Chalmers DaCosta, *Modern Surgery*, 8th ed., 1919.

<sup>3</sup> *Ibid.*



of trauma, either several months after the injury, as in Leszynsky's<sup>1</sup> case or as late as twenty years, as in Keen's.<sup>2</sup> In a Philadelphia fireman a sarcoma developed within three months after a head injury. It arose from a fissure in the basilar process of the occipital bone.

## INJURIES OF NERVES

Neuritis is a common result of nerve contusion. It may follow a blow over the nerve trunk, a wound, an electric shock, or stretching and tearing in dislocation or fracture. It may occur as the result of extension of inflammation from a neighboring part (neuritis in septic wounds of the extremities).<sup>3</sup> Neuritis is accompanied by swelling, glossy skin, trophic lesions of the skin, nails and hair, vasomotor disturbances, muscular atrophy, and the reactions of degeneration. Reactions of degeneration cannot be simulated and do not occur in hysteria. A muscle injury may be associated with a nerve injury. A blow upon the deltoid muscle may make it impossible for the patient to lift the arm far away from the side (circumflex paralysis). Early in such a case the entire muscle will not show the reactions of degeneration, but some of the fibers will. The joint supplied by an injured nerve is apt to become inflamed and may even become ankylosed. Over half a century ago S. Weir Mitchell described deformities of joints due to nervous traumatic lesions. Mme. Athanassio Benisty<sup>4</sup> tells us that musculo-spiral paralyses are frequently accompanied by ankylosis of the fingers; that in wounds of the median nerve the articulations most affected are the metacarpophalangeal and the interphalangeal (the elbow being rarely affected); that in wounds of the ulnar nerve causing complete painless paralyses there frequently arise multiple articular rigidities affecting the elbow, wrist, metacarpophalangeal, and interphalangeal joints; that ankylosis of the knee or ankle, as a result of severe lesions of the great sciatic and of its external branch of bifurcation, is hardly ever seen, but as a result of this condition the phalangeal joints of the toes may be affected by a certain degree of stiffness; that incomplete lesions, however, of the trunk of the sciatic (especially those involving the internal popliteal nerve) may cause ankylosis of the knee and ankylosis in extension of the tibiotarsal and metatarsophalangeal joints (especially the joints of the big toe). Incomplete lesions of the median and sciatic nerves have the most pernicious effects on the joints. Pitres<sup>5</sup> believes that it is quite impossible to make a certain diagnosis of anatomic or histologic interruption of the nerve, but the only diagnosis possible is that of physiologic interruption of the transmission of nerve impulses and impressions.

<sup>1</sup> W. M. Leszynsky, Jour. Amer. Med. Assoc., Oct. 19, 1907.

<sup>2</sup> W. W. Keen, Jour. Amer. Med. Assoc., Nov. 30, 1907.

<sup>3</sup> Church and Peterson, Nervous and Mental Diseases, 1914.

<sup>4</sup> Mme. Athanassio Benisty, Medical and Surgical Therapy, 1918, ii, 391-403.

<sup>5</sup> A. Pitres, La valeur des signes cliniques permettant de reconnaître dans les blessures des nerfs périphériques: A. La section complète du nerf; B. La restauration fonctionnelle, Société de Neurologie, April 6, 1916. Revue Neurologique, April-May, 1916, p. 477. (Quoted by A. Benisty.)

"For even if loss of conduction necessarily follows transverse section of the nerve, it can just as well be the result of injuries which have affected the nerve-fibers without dividing the neurilemma—such as contusions, compressions, constrictions, and possibly even mere commotion of the nerve trunk." Zimmern and Perol,<sup>1</sup> among other causes of traumatic paralyses of nerves, mention section, contusion, stretching, burns, pressure from hematoma, abscesses, splinters of bone, callus, traumatic neuroma, involvement in scar tissue, fibrous bands, etc. Occasionally dislocation of the ulnar nerve occurs as a result of trauma. This may or may not be a complication of fracture or dislocation. Wharton<sup>2</sup> has reported 14 such cases. Two have been operated upon in the Jefferson College Hospital within the last three years. Edsall<sup>3</sup> learned from Latta that some locomotive engineers suffered from right-sided sciatica because they sat sidewise on the bench of the right-hand side of the engine cab and were jolted in such a manner as to throw the body weight continually on the right thigh and buttock (Kober and Hanson).

### INJURIES TO THE ABDOMEN

Abdominal injuries due to railway accident do not differ from abdominal injuries inflicted by other means. Wounds are apparent and offer no opportunity for dispute. Contusions present obvious signs. After contusion of the abdomen profound shock may render diagnosis as to the intra-abdominal condition impossible. Shock may be entirely out of proportion to the apparent gravity of the injury and it may be indicative of grave visceral calamity. As shock abates the surgeon may be able to determine if he is dealing with a trivial and temporary derangement or if abdominal section is requisite in order to make a diagnosis. In speaking of contusions of the abdomen Bottomley<sup>4</sup> believes that "there is no sign or combination of signs sufficiently constant to indicate the nature of the injury or to serve as an adequate basis for definite diagnosis. In severe cases exploratory laparotomy is the only means we have for making a diagnosis in season for effective treatment." Crile<sup>5</sup> thinks that contusion of the abdomen by considerable force must be considered important until proved innocent. DaCosta<sup>6</sup> says that "In some cases of contusion of the abdominal wall only the parietes are damaged; in other cases the viscera or the abdominal tissues are injured. Contusion may involve the skin alone, or may involve the skin, muscles, and peritoneum. In simple contusion there is considerable shock if the injury be severe. There is pain increased by respiration, motion, pressure, and attempts at urination or defecation. When tenderness is not found soon after

<sup>1</sup> A. Zimmern and P. Perol, *Medical and Surgical Therapy*, 1918, vol. vi.

<sup>2</sup> H. R. Wharton, *Amer. Jour. Med. Sci.*, Oct., 1895.

<sup>3</sup> Edsall, *Jour. Amer. Med. Assoc.*, 1909, liii, 1876.

<sup>4</sup> J. T. Bottomley, *Keen's Surgery*, 1913, vi, 450. (See also Bibliography appended, p. 451.)

<sup>5</sup> G. W. Crile, *Keen's Surgery*, 1910, i, 917.

<sup>6</sup> J. Chalmers DaCosta, *Modern Surgery*, 8th ed., 1919.

the accident but appears some days later there is usually deep-seated injury. Extensive ecchymosis may appear. Even after a severe contusive force has been applied there may be no discoloration. There is great ecchymosis in anemic persons, victims of hemiplegia, obese individuals, opium eaters, and drunkards. In severe cases the tissues are pulpified and sloughing inevitably ensues. Abscess occasionally follows contusion. The prognosis after abdominal contusion is always uncertain." As the result of injury to the abdomen the muscular structures may be bruised, ruptured, or even disintegrated. In some cases with visceral injury there is no external evidence of traumatism; and there are even cases on record of persons who have walked for miles after serious visceral injury. Complete muscular rupture is an unusual accident, but occasionally happens. It is accompanied by severe pain and usually shock, and it may lead to hernia or even cause death. DuCuing and Florence<sup>1</sup> believe that a contusing force applied to the abdomen can tear the vena cava, abdominal aorta, and other large vessels without rupturing the intestines, and Bottomley<sup>2</sup> thinks that a deficiency in the vessel wall is the principal factor in its rupture. Limited rupture or partial tearing of muscles from their points of origin is quite common. If a man has been suffering from a prolonged sickness, especially a fever, muscular rupture from injury is most apt to happen. Where the injury to the abdomen is sufficient to cause visceral injury, the intestine, spleen, liver, pancreas, kidney, or peritoneum (parietal, uterine, visceral, or mesenteric)—one or more of these structures are usually involved. The stomach may be ruptured. The kidney and the spleen may be ruptured simultaneously.<sup>3</sup>

The most serious injuries to the abdominal contents can be inflicted by a railroad accident. In some cases the abdominal contents suffer injury from broken ribs. The liver may be lacerated or ruptured or torn from its supports. The spleen may be ruptured (especially if malarial) or dislocated or made to wander. The mesentery or omentum may be torn. The pylorus, intestines, or great vessels may be lacerated. There may be rupture of a kidney, of a suprarenal capsule, of the ureter, of the pancreas, of the gall-bladder, of the diaphragm, or of the peritoneum. These injuries present nothing especially apt to lead to disagreement in settling a claim. Among the possible consequences of abdominal injury out of which litigation may arise are: Aneurysm of the aorta, movable kidney, floating spleen or liver, dislocation of an ovary, displacement of the uterus, abscess of the liver, cyst of the pancreas, hernia, pyonephrosis or hydronephrosis, perineal abscess, or retroperitoneal sarcoma. Injury of an organ, such as the kidney, by making it a point of least resistance, may lead to the development of tuberculosis. It has been said that ulcer of the stomach may be caused by

<sup>1</sup> DuCuing and Florence, *Rev. de Gyn. et de Chir. abdom.*, 1911, xvi, 13 (quoted by Bottomley).

<sup>2</sup> J. T. Bottomley, *Keen's Surgery*, 1913, vi, 450. (See also Bibliography appended, p. 451.)

<sup>3</sup> H. L. Rocher, *Jour. de Med. de Bordeaux*, Feb., 1918 (abst. Ochsner, *Prac. Med. Series*, 1919).



injury to the abdomen as the result of squeeze between the buffers or between the opposite seats of a railway carriage in an accident, as in a case recorded by Rendie.<sup>1</sup> There have been some American cases of gastric ulcer reported as having been due to trauma. Jonas<sup>2</sup> reports the case of a man who, while working under a freight car, was struck in the epigastrium by a brake beam and who at operation was found to have ulcer of the stomach and ulcer of the duodenum. Kemp<sup>3</sup> does not believe it probable that simple trauma, unless other conditions are associated, can produce gastric ulcer, because such traumata to the mucosa of the stomach as blows, falls, and swallowing of knives have produced marked hemorrhage without ultimate ulcer; and because Griffini and Vasale have resected or burned out portions of the mucosa of the stomach of animals and perfect healing has taken place with no ulceration. The experience of surgeons in gastric surgery proves the truth of Kemp's contention. Kemp<sup>4</sup> cites a case, in his own practice, of a young lady who was thrown from a trolley car and traumatized in the epigastrium. She developed ulcer, but Kemp thinks that she probably had been anemic and had hyperchlorhydria before the accident. While we can understand that trauma could be the exciting (or imagine that it might be the sole) cause of gastric ulcer we do not believe that this causal relationship can be proved. It is perfectly clear to us, however, that trauma to the abdomen might very readily cause the perforation of an existing gastric or duodenal ulcer. As to the possibility of a blow on the abdomen producing appendicitis Moorhead<sup>5</sup> sees no more relation than between a blow on the neck and tonsillitis. Deaver<sup>6</sup> feels "perfectly confident that trauma is incapable of producing pathologic changes in a perfectly healthy appendix." Sprengel<sup>7</sup> says that no case in literature, ascribed to abdominal trauma as causal, can be confirmed by scientific evidence. It is theoretically possible but highly improbable that appendicitis could arise from external traumatism. In most supposed cases the injury simply "awakened a sleeping dog" and stirred into activity an appendix already diseased. Trauma has frequently been mentioned as a possible cause of intussusception and a blow, crush, or fall has been associated with intussusception six times in one series of 300 cases.<sup>8</sup> This relationship was probably merely coincidental. If a hernia occurs suddenly, after an accident, the sufferer believes that his hernia was formed then and there, but in most instances "the extrusion of bowels or omentum and its entrance into the sac were but the last of a long series of antecedent and preparatory changes."<sup>9</sup> Brouardel<sup>10</sup> does not believe that the hernia is often an accident, but

<sup>1</sup> A. W. Mayo Robson, *Keen's Surgery*, 1910, iii, 844.

<sup>2</sup> A. F. Jonas, *The Railway Surgical Journal*, Jan., 1907.

<sup>3</sup> R. C. Kemp, *Diseases of the Stomach, Intestines, and Pancreas*, 1917.

<sup>4</sup> *Ibid.*

<sup>5</sup> J. J. Moorhead, *Traumatic Surgery*, 1917.

<sup>6</sup> J. B. Deaver, *New York Medical Journal* (quoted in *The Railway Surgical Jour.*, Dec., 1907).

<sup>7</sup> Sprengel, *Deut. med. Woch.*, Dec. 14, 1911.

<sup>8</sup> Eliot and Corscaden, *Annals of Surgery*, Feb., 1911.

<sup>9</sup> J. Chalmers DaCosta, *Modern Surgery*, 8th ed., 1919.

<sup>10</sup> P. Brouardel, *Les Blessures et les accidents du Travail*, 1906, p. 482.

thinks that it is a weakness, the result of a congenital malformation. ("Dans la grande majorite des cas, la hernie inguinale n'est pas un accident soudain, c'est une infirmité preparee par une malformation congenitale.") Very rarely traumatism may cause a hernia immediately, no sac having existed before the accident. Such a condition is a true rupture. Selby's<sup>1</sup> case, in which the trauma ruptured the aponeurosis, internal oblique and transversalis, seems to have been one of true traumatic hernia. "The old and erroneous idea was that a hernia was always formed by tearing of the peritoneum; hence the term rupture. This mode of formation is extremely unusual, but occasionally does occur. Coley saw such a case."<sup>2</sup> True traumatic hernia, while more common in the inguinal region, may occur anywhere in the abdomen. "In true traumatic hernia there are violent pain, collapse, vomiting, inability to walk and stand, and the mass does not return to the belly on recumbency, but must be reduced by taxis or operation."<sup>3</sup> The relationship between accident and hernia has been exhaustively treated by, among others, Coley,<sup>4</sup> Coley and Satterwhite,<sup>5</sup> Berger,<sup>6</sup> Van Hassel and Walravens,<sup>7</sup> Daget,<sup>8</sup> and Fargue and Jeanbrau.<sup>9</sup> See also "Traumatic and Industrial Hernia,"<sup>10</sup> which is a report of the medical section of the American Railway Association. The committee consists of W. B. Coley (chairman), S. Leigh, J. B. Walker, C. W. Hopkins, and J. A. Hutchison.

## INJURIES OF THE CHEST

As a result of being caught under a heavy object, a cave in of earth, or of being crushed in a crowd during a panic, etc., compression upon the chest, or abdomen, or both may be so severe as to cause the condition known as traumatic asphyxia (pressure stasis; the ecchymotic mask). The hue of violet luridity which arises immediately and spreads over the head and neck soon disappears if there are no associated injuries. Cases of traumatic asphyxia have been reported by Winslow,<sup>11</sup> Joynt,<sup>12</sup> Birge<sup>13</sup> (patient caught between a platform and the edge of a car) Beach and Cobb,<sup>14</sup> Villemin,<sup>15</sup> Despard,<sup>16</sup> Ettinger,<sup>17</sup>

<sup>1</sup> C. D. Selby, Jour. Amer. Med. Assoc., Nov. 3, 1906.

<sup>2</sup> J. Chalmers DaCosta, Modern Surgery, 8th ed., 1919.

<sup>3</sup> Ibid.

<sup>4</sup> W. B. Coley, International Journal of Surgery, Feb., 1908.

<sup>5</sup> Coley and Satterwhite International Jour. of Surg., Feb., 1904.

<sup>6</sup> Paul Berger, Rev. de Chirurgie, 1906, April and May.

<sup>7</sup> Van Hassel and Walravens, Jour. de Chirurgie, Bruxelles, 1903, 128.

<sup>8</sup> Daget, These de Paris, 1905.

<sup>9</sup> Fargue and Jeanbrau, Accidents du Travail, Paris, 1905.

<sup>10</sup> Annals of Surgery, April, 1922, p. 467.

<sup>11</sup> R. Winslow, Med. News, Feb. 4, 1905.

<sup>12</sup> R. L. Joynt, Lancet, April 1, 1905.

<sup>13</sup> R. H. Birge, Cleveland Med. Jour., Sept., 1905.

<sup>14</sup> Beach and Cobb, Annals of Surgery, April, 1904.

<sup>15</sup> Villemin, Bull. et mem. de la Soc. Chir. de Paris, No. 9, 1906.

<sup>16</sup> D. L. Despard, Annals of Surgery, June, 1909.

<sup>17</sup> Ettinger, Wein. Klin. Wochen., 1907, vol. xx.

and Lange.<sup>1</sup> Moorhead<sup>2</sup> saw a case, and DaCosta<sup>3</sup> has seen 2 cases. Despard<sup>4</sup> collected 17 cases from recent literature and reported a case of his own. Lange<sup>5</sup> stated in 1912 that since 1898, 295 cases of compression of the trunk had been treated at the Halle Clinic, but that distinct traumatic asphyxia had occurred in but 10 and had been slightly marked in 13. Wounds of the chest are evident, although the extent of the injury may be a matter of dispute. Penetrating wounds may be extremely grave, an intercostal artery may be severed or the internal mammary artery may be divided. A wound of the pleura is usually associated with a wound of the lung. The pericardium or heart or great vessels may be injured by a penetrating wound of the chest. Such a wound may involve the thoracic duct (seldom) or the diaphragm. Non-penetrating wounds of the chest may give rise to local abscess or cellulitis, but are seldom of moment. Sudden admission of a quantity of air into the pleural cavity as a result of a wound of the chest wall may be, though it seldom is, fatal (acute traumatic pneumothorax). Wounds of the chest are fully discussed in works upon surgery. Contusions of the chest without fracture are sometimes the occasion of legal contention. Such injuries are not unusual, and the lesions are frequently obscure. These injuries arise from squeezing forces or hurling against seats, other people, the floor, or sides of a car. The external evidence of injury may be slight; in fact, may be wholly absent even in cases where great damage has been inflicted, or when death occurs. The subcutaneous veins are small, and the integument and muscle of the chest are mobile, hence extensive ecchymosis is rare and hematoma practically never occurs except over the scapula. It can then be laid down as a rule that the absence of obvious bruising is no sign that great injury has not been inflicted. A contusion of the chest may be trivial and limited to the superficial parts of the thoracic wall; it may involve the muscles; it may be associated with fracture of the ribs or sternum or dislocation at the gladiomanubrial junction<sup>6</sup> or even dislocation of the ensiform process (very rare). It may cause fracture of the costal cartilages. Usually an injury to the chest sufficiently grave to fracture or dislocate the sternum, at the same time, lacerates the pleura or pericardium with resulting hemorrhage into the pleural sac or the anterior mediastinum. Great violence to the chest may break the sternum, ribs, and spine simultaneously. As a late consequence of fracture of the sternum necrosis of this bone may take place or a mediastinal abscess may form. Contusion of the chest may be associated with grave visceral injury. After a severe trauma to the chest there is great shock and there may even be instant death. The condition of shock so produced is called *concussion of the chest*.<sup>7</sup> When

<sup>1</sup> Lange, Zeitschrift für Chirurgie, Dec., 1912.

<sup>2</sup> J. J. Moorhead, Traumatic Surgery, 1917, p. 290.

<sup>3</sup> J. Chalmers DaCosta, Modern Surgery, 8th ed., 1919.

<sup>4</sup> D. L. Despard, Annals of Surgery, June, 1909.

<sup>5</sup> Lange, loc. cit.

<sup>6</sup> W. A. James, Lancet, July 14, 1906.

<sup>7</sup> F. T. Stewart, A Manual of Surgery, 1911, p. 404.



death is produced by concussion and without any gross anatomic change, it "is probably due to direct concussion of the heart muscle or its nerve mechanism."<sup>1</sup> Rupture of the azygos vein may result from severe force applied to the chest wall. Traumatism of the chest may cause rupture of the diaphragm or rupture of the lung. When pleurisy or pneumonia follows an accident it is always well to consider the possible influence of exposure before ascribing trauma as the sole cause. Pneumonia is rarely the result of trauma to the chest.<sup>2</sup> A contusion of the chest may cause sprain of the rib articulations or partial rupture of a muscle—often sources of prolonged pain and disability. Rupture of muscle will be followed by more or less muscular wasting.

Among the injuries which have occurred without fracture or which have followed simple contusion may be mentioned: limited pleurisy; pleurisy with effusion; hemothorax; empyema; pneumothorax; local pneumonia, self-limited and with slight symptoms; septic pneumonia, the contusion having made the lung a point of least resistance; hernia of the lung with the skin intact; rupture of the diaphragm, with or without diaphragmatic hernia; laceration of the pleura and pericardium; emphysema without external wound due to lung rupture (when the pleura is not broken, emphysema may occur at the root of the neck), and laceration of the pericardium or heart. "Traumatic Subcutaneous Emphysema" is the name given by Gardner and Jones<sup>3</sup> to a paper in which they discuss collections of air under the skin following injury. Most of us have noted this phenomenon following fracture of ribs, where a rib fragment has penetrated parietal and visceral pleuræ as well as lung tissue. On inspiration the lung expands and air rushes into the pleural cavity; on expiration the lung collapses and the rent in the lung tissue is closed so that withdrawal of air from pleural cavity becomes impossible. The air may dissect its way subcutaneously down over the chest, trunk, pelvis, or even to the external genitalia.<sup>4</sup> We have all observed it travel upward over the neck, face, and scalp. Besides puncture of pleuræ and lung by rib fragments or foreign bodies, other possible causes of traumatic subcutaneous emphysema are rupture of any part of the alimentary canal (gullet, stomach, intestine, rectum), rupture of air-passages (nose, trachea, air sinuses, bronchus). After injury to the chest a careful examination should be made for fractures of ribs, sprains of articulations, muscular rupture, and separation of cartilages. A patient with pain instinctively will limit respiration on the affected side. In an old chest injury there may be thickening of the rib at the site of the old fracture or sprain; or there may be tenderness over costal articulations; or there may be pleuritic adhesions. As more or less late results of injury to the chest there have been noted cellulitis of the mediastinum which

<sup>1</sup> G. W. Crile, *Keen's Surgery*, 1910, i, 917.

<sup>2</sup> G. W. Norris and H. R. M. Landis, *Diseases of the Chest and the Principles of Physical Diagnosis*, 2d ed., 1920, p. 404.

<sup>3</sup> Gardner and Jones, *Jour. Amer. Med. Assoc.*, 1921, lxxvi, 503.

<sup>4</sup> Alexander and Follett, *Jour. Amer. Med. Assoc.*, 1919, lxxii, 930.

may follow a penetrating wound; subpectoral abscess, cases of which have been reported by Musser,<sup>1</sup> Ashhurst,<sup>2</sup> and Riesman<sup>3</sup>; supra-scapular abscess<sup>4</sup> and caries of the ribs.<sup>5</sup> Regarding the part that trauma to the breast may play in the causation of malignancy DaCosta<sup>6</sup> says that in cases of diffused sarcoma "a history of injury can often be elicited," and, speaking of carcinoma of the mammary gland of the female, "trauma has no apparent influence in producing cancer." In Warfield's<sup>7</sup> collection of 37 cases of cancer of the male breast, 8 gave a history of injury. Except in one case, Moorhead<sup>8</sup> has never been able to satisfy himself that an accident was wholly responsible for the tumor. This was the case of a woman who fell from the platform of a steam railway coach, striking her breast against the last step. Nine months after this accident the breast was removed and proved to be carcinomatous. About four weeks before this accident both her breasts had been examined by her family physician and found normal.

## STRAINS AND SPRAINS

A sprain is a wrench of a joint, the result of a sudden twist or of traction. The ligaments are pulled upon and perhaps lacerated and the parts about are damaged. A muscular strain is caused by stretching and some fibers of the muscle are ruptured. There is often a combination of both injuries. Strains vary in severity from slight stretching to absolute rupture of muscular fibers. In a severe case the muscular rupture may be partial or complete, the latter injury being most likely to occur in the long-bellied muscles. Rupture of fibers is often attended by an audible snap, and gives rise to instant pain, which may become excruciating in severe injuries—the *coup de fouet* of our French confrères. (Rupture of the plantaris muscle causing lawn-tennis leg; of the extensor longus pollicis causing "drummer's paralysis." Rupture of the long head of the biceps; of the quadriceps extensor femoris, etc., occur.) Strain of the psoas muscle may simulate appendicitis. Strain of the pronator radii teres causes lawn-tennis arm; strain of the abductor muscles of the thigh causes rider's leg and strain of the long head of the biceps flexor cubiti causes the ball player's "glass arm." Strain of the back, referred to earlier in this article, is often associated with sprain of the vertebral articulations. After an accident, strain alone may exist or it may be associated with fracture of bone, dislocation, sprain, contusion, etc. Muscles and tendons may be dislocated as a result of injury. The muscles most frequently displaced are: the long head of the biceps (oftenest), the flexor carpi ulnaris, the peroneus brevis, the

<sup>1</sup> J. H. Musser, Virginia Med. Semimonthly, Sept. 7, 1906.

<sup>2</sup> A. P. C. Ashhurst, Surgery, Its Principles and Practice, 1914, pp. 730, 731.

<sup>3</sup> D. Riesman, New York Med. Jour., April 3, 1915.

<sup>4</sup> A. P. C. Ashhurst, loc. cit.

<sup>5</sup> Ibid.

<sup>6</sup> J. Chalmers DaCosta, Modern Surgery, 8th ed., 1919.

<sup>7</sup> Warfield, Bull. Johns Hopkins Hosp., Oct., 1901.

<sup>8</sup> J. J. Moorhead, Traumatic Surgery, 1917, p. 548.

peroneus longus, the tibialis posticus, the sartorius, the plantaris, the quadriceps extensor femoris, and the extensors back of the wrist. So-called dislocation of the latissimus dorsi muscle is really paralysis of the serratus magnus. Injury may be responsible for contractions of muscles, hernia of muscles, bursitis, thecitis or tenosynovitis, felon, palmar abscess, or abscess elsewhere. A single severe closed injury may cause myositis ossificans traumatica. The condition does not arise after open injuries. Strains and sprains are sometimes followed by persistent and disabling contractures. Bruises are occasionally followed by sarcoma. The muscles most apt to suffer from sprains, strains, and contusions are the deltoid, pectoralis major, biceps, pronator radii teres, abductors of the thigh, hamstring muscles, and extensors of the spine. A contusion or strain of the deltoid may produce paralysis and subsequent atrophy. This condition may be produced by direct force, by pulls upon the extended hand, or by sudden and violent abduction. In deltoid palsy the shoulder-joint often becomes ankylosed and other muscles of the shoulder and arm may become involved. Strains of the gastrocnemius and soleus are particularly apt to be followed by permanent contraction. When this occurs the heel is raised from the ground. A strain may be followed by periostitis at the point of muscular insertion or by subperiosteal fracture. Strains and sprains are often associated with the tearing off of a particle of bone—the “strain-fracture” or “sprain-fracture” to which Callender drew attention in 1870, which W. W. Keen referred to as “masked fracture” in 1874, which was termed “sprain-fracture” by Sir William Bennett in 1906, which was called “strain-fracture” by Sidney Lange in 1908, and about which, as “sprain-fracture,” Ross and Stewart<sup>1</sup> wrote in 1912. Ross and Wilbert<sup>2</sup> in 1902 warned us to suspect fracture in so-called sprains which remain swollen and painful and resist treatment. A trauma calls attention to the existence of Schlatter’s sprain (Schlatter’s disease, Osgood-Schlatter disease) by causing a sprain fracture in the diseased area. As the result of a railway accident any or several joints may suffer sprain. Ankle, wrist, elbow, knee, hip, vertebral joints, and sacro-iliac or any of the small joints of the hands and feet may suffer. Proper responsibility for many cases of lumbago, paraplegia, sciatica, vague back aches, etc., was first placed upon the sacro-iliac joint in 1905 by Goldthwaite and Osgood.<sup>3</sup> A danger following sprain of a joint is ankylosis. A sprained joint is a point of least resistance to the bacillus of tuberculosis.<sup>4</sup> Rarely, osteoarthritis arises in a hip-joint following sprain and after sprain of the hip absorption of the head of the bone may occur. Sprain fractures can be diagnosticated with certainty by the *x*-rays only.

<sup>1</sup>G. G. Ross and L. F. Stewart, *Annals of Surgery*, Oct., 1912.

<sup>2</sup>G. G. Ross and Wilbert, *Amer. Med.*, Jan. 25, 1902.

<sup>3</sup>J. E. Goldthwaite and R. B. Osgood, *Boston Med. and Surg. Jour.*, May, 1905.

<sup>4</sup>J. Chalmers DaCosta, *Relation of Trauma to Tuberculosis*, *Annals of Surgery*, June, 1914.



## FRACTURES AND BONE DISEASE

Fractures resulting from a railroad accident are apt to be comminuted and compound. They may be associated with dislocation; may be single or may be multiple of one bone, or may involve several bones. In addition to all the more common fractures, railway accidents not unusually produce fractures rarely met with from other causes. Among these unusual breaks may be mentioned the following: Fracture of the first rib; partial fracture of a rib or of a rib near the vertebral column or near the sternum; fracture of the outer or the inner end of the clavicle; multiple fractures of the clavicle; fracture of the sternum (usually transverse); fracture of an upper angle of the sternum; separation of the manubrium and gladiolus, or of the gladiolus and ensiform cartilage; fracture of the costal cartilages; fracture of the neck, coracoid process, or body of the scapula; fracture of the acetabulum; fracture of the fibula high up; fracture of the condyle or coronoid process of the lower jaw; and epiphyseal separations. Fracture of the pelvis frequently results from railway accidents and often is accompanied by such complications as rupture of the bladder; rupture of the urethra; injury to the rectum, small or large intestine; laceration of the vagina or uterus; violent hemorrhage; and fracture of other bones. Four of the cases reported by Ryan<sup>1</sup> were the result of railway injury. In one of Ryan's 25 fractured pelvises, due to various agencies, the deep epigastric artery was torn. Rupture of the bowel and septic peritonitis may follow fracture of the pelvis. If the sacrum be fractured, paralysis usually occurs in the territory supplied by the sacral plexus. Several days after fracture of the pelvis the patient may develop abscess in the perineum, groin, over the hip, or in the gluteal region,<sup>2</sup> and Mengel<sup>3</sup> cites a case with perineal, suprapubic, and rectovesical fistula ten years after fracture of the pubes. Coccygodynia is not often the result of fracture or dislocation of the coccyx and usually is a referred pain. It is quite common in the traumatic neuroses. Various bone diseases may result from a railway injury: periostitis, osteoperiostitis, osteomyelitis, caries, necrosis, sarcoma, etc. Bone tuberculosis may be determined by trauma.<sup>4</sup>

In an individual with tertiary syphilis bone injury may lead to the localization of a syphilitic process, such as syphilitic periostitis, at the point traumatized.<sup>5</sup> A large gumma in a bone weakens the latter so that fracture may take place from slight force. Other contributory causes of fracture are hereditary fragility, fragilitas ossium (osteopathyrosis), osteogenesis imperfecta and brittleness due to senility, wasting diseases, scurvy, scarlatina, bone-cyst, malignant disease of bone, and certain nervous disorders (locomotor ataxia, syringomyelia,

<sup>1</sup> W. J. Ryan, *Annals of Surgery*, March, 1920.

<sup>2</sup> *Ibid.*

<sup>3</sup> S. P. Mengel, *The Pennsylvania Med. Jour.*, Nov., 1919.

<sup>4</sup> J. Chalmers DaCosta, *Relation of Trauma to Tuberculosis*, *Annals of Surgery*, June, 1914.

<sup>5</sup> See "The Rôle of Trauma in Lesions of Syphilis," by I. H. Tumpeer in *Jour. Amer. Med. Assoc.*, January 21, 1922.

and paralysis agitans). The bones of the chronic insane are frequently brittle and paretic demented are likely to have fragile bones. Phosphorus workers are especially liable to fracture. Rickets predisposes to fracture. Osteomalacia predisposes to fracture of the long bones, sternum, and ribs. The wasted femur of hip-joint disease is liable to fracture. Aneurysm may so compress ribs, sternum, or vertebræ as to render these bones atrophic and easy to fracture. Sarcoma, hydatid cyst, caries, necrosis, gout, tuberculosis, and mollities ossium may also be pathologic predisposing causes of fracture. Fractures in the neighborhood of joints require the most painstaking attention. Fractures of the olecranon and of the patella call for considerable skill in their management. Fractures of small bones (bones of foot, hand, wrist) are liable to cause chronic disability and may even be overlooked, as in the case of the locomotive engineer who came to the senior author with a fracture of the carpal scaphoid three years after a blow on his palm with the reverse lever. The condition was recognized as the one described by Codman and Chase.<sup>1</sup>

## DISLOCATIONS AND JOINT DISEASES

Dislocations due to railway accident may be multiple, may be compound, and are frequently associated with fracture. Ross and Stewart<sup>2</sup> state that in traumatic dislocation sprain-fracture is almost invariable. There are "loose jointed" individuals who can, at will, dislocate the thumb and other joints of the hands. In a person with very thin, loose ligaments—an acrobat, for instance—there may be an apparent dislocation when none exists. Such a person is Whitman, "the joint thrower," quoted by Moorhead.<sup>3</sup> An acrobat was brought into the Jefferson Hospital for a supposed dislocation of a cervical vertebra. The bone was out of place, but he could dislocate it and restore it voluntarily. Years before he had injured his neck diving. He made a business of staging accidents and suing corporations. Certain unusual dislocations may occur in railway accidents, viz.: dislocation of a rib from a vertebra or from the sternum, dislocation of the clavicle, dislocation of the shoulder or hip in a child, luxatio erecta of the shoulder. Complete lateral dislocation of the forearm may occur. Simultaneous dislocation of both ends of the clavicle (total dislocation) is usually caused by "a compression of both shoulders between two cars moving in opposite directions."<sup>4</sup> Alexander Gibson<sup>5</sup> reported a dislocation of the sacroiliac joint. Dislocation of the semilunar cartilage is not uncommon and may occur while stepping off a moving car. Henderson<sup>6</sup> has reported 61 cases and Strahlmann and White<sup>7</sup> have reported 76 cases and also reviewed the literature.

<sup>1</sup>Codman and Chase, *Annals of Surgery*, March and June, 1905.

<sup>2</sup>G. G. Ross and L. F. Stewart, *Annals of Surgery*, Oct., 1912.

<sup>3</sup>J. J. Moorhead, *Traumatic Surgery*, 1917, p. 164.

<sup>4</sup>D. N. Eisendrath, *Keen's Surgery*, 1910, ii, 395.

<sup>5</sup>Alexander Gibson, *Jour. Amer. Med. Assoc.*, May 28, 1921, p. 1487.

<sup>6</sup>Henderson, *Annals of Surgery*, May, 1920.

<sup>7</sup>Strahlmann and White, *Jour. Amer. Med. Assoc.*, February 26, 1921, p. 561.

Various joint diseases may follow injury: Synovitis, effusion of blood (especially into the knee-joint in the case of hemophiliacs), arthritis, ankylosis, tuberculosis in the predisposed,<sup>1</sup> and syphilitic processes in those who are infected with syphilis.

**The x-Rays.**—Pfahler<sup>2</sup> states that accurate diagnosis of fractures and of all lesions of the bones demands the use of roentgenograms and that fluoroscopic examinations alone cannot be depended upon. He says that in fractures the x-rays enable us to determine the nature and extent of the injury, the amount of splintering, the degree of impaction, the relation of the fragments to each other, the direction of the line or lines of fracture, the variety of the deformity, the existence of multiple fractures, the existence of ununited fractures, the presence of callus, and whether the callus is healthy or necrosis is taking place in the fragments. Skiagrams should be made both before and after the reduction of a fracture or a dislocation. In speaking of the dangers of misinterpretation, Albee<sup>3</sup> states: "In the case of many pathologic conditions of the bones and joints it is very unsafe and unwise to make positive deductions and assertions from apparent variations from the normal in one plate. It must be constantly borne in mind that, as a matter of routine, it is practically impossible to place the patient and the photographic plate in such relationship to one another that the coronal or frontal (side-to-side) place of the former will lie exactly parallel with the flat surface of the latter or at a right angle to it. Any deviations of these relationships is bound to cause distortions in the x-ray shadows upon the plate; this is particularly true in comparing one side of the body with the other." The same author further remarks "that in many instances it is as unsafe to draw definite diagnostic conclusions from an x-ray examination alone, unsupported by clinical data, as it is to render an unqualified opinion on the unsupported evidence of any other single laboratory or clinical examination." Most of the diseases of bone can be demonstrated by the x-rays when the plates are interpreted by an expert. "It should be remarked that in the earliest stages of acute osteomyelitis the diagnosis cannot be made by the Roentgen rays. Hence a negative report is by no means final. Tuberculosis of bone, sarcoma of bone, gumma of bone, periositis, and advanced osteomyelitis"<sup>4</sup> can be diagnosed by the experienced and skilful skiagrapher. "All diseases of the joints can be demonstrated by the Roentgen rays if there be change in the bony structure, exudate into the joint spaces, or thickening of the soft tissues about the joints."<sup>5</sup> The x-rays are not infallible, even in the hands of the youngest roentgenologist. An epiphyseal separation may not be detected and a slight angling of the plate may give a deceptive appearance of distortion.

<sup>1</sup> J. Chalmers DaCosta, Relation of Trauma to Tuberculosis, *Annals of Surgery*, June, 1914.

<sup>2</sup> G. A. Pfahler, DaCosta's *Modern Surgery*, 8th ed., 1919, p. 1610.

<sup>3</sup> F. H. Albee, *Orthopedic and Reconstruction Surgery*, 1919, p. 163 et seq.

<sup>4</sup> G. A. Pfahler, *loc. cit.*

<sup>5</sup> *Ibid.*



## SOME GENERAL CONCLUSIONS

The possibilities of injury as a result of railway accident are almost infinite. Estes<sup>1</sup> says that "Injuries on the railroad are peculiar only in their great severity and the multiple character of the injuries. On this account and because of the horror so commonly preceding and attending these injuries, there is, as a rule, more shock from railroad injuries than from any other class of accidents. Psychic shock is especially severe. Subcutaneous lacerations of the soft tissue of a very severe character are common; and though it seems a little paradoxical, it is true, nevertheless, that severe injury, commonly entire destruction of the skin of a section of a limb, with very slight subcutaneous injury, frequently results from railroad accidents. Squeezing between bumpers or between the ends of the cars produces the first, and impact of a wheel as it pushes a member along a rail without actually passing over it causes the latter form of injury." The locomotive engineer may be imprisoned under the fire-box in a wreck, steam pipes may burst, the wreck may take fire—the results being scalds and burns of every degree. Arms and legs are often horribly crushed in a railway accident, and here, as elsewhere in traumatic surgery, there always lurks the terrible tetanus bacillus ready to invade fresh wounds and burns. In this connection we shall again quote Estes,<sup>2</sup> who warns against the use of soiled coverlets or blankets—especially horse blankets—as covers for human beings with open wounds. He has seen several burned cases develop tetanus after they had been brought to the hospital in horse blankets.

A railway accident may be responsible for complicating or aggravating an existing disease or for developing a latent tendency. Biliary colic may arise in a person with gall-stones. Appendicitis may be awakened in a person who has had previous attacks. A hernia may be rendered irreducible, inflamed, incarcerated, or strangulated, or it may rupture.

Fragments of glass from a bursting water gage may cause injury to the eyes of the engineer or fireman. De Lapersonne<sup>3</sup> ligated the carotid artery for traumatic exophthalmos following a railway accident. Osler<sup>4</sup> observed 2 instances of liver abscess in trainmen who had been injured while coupling cars. The same authority states that injury to the head is not very infrequently followed by liver abscess. A blow over the gall-bladder may be responsible for gangrene, as is shown by the case reported by J. Louis Ransohoff.<sup>5</sup> In considering railway accidents one is obliged to scan the entire subject of traumatic surgery, and even then it is difficult or impossible to separate conditions, the result of trauma only, from those in which inherent pathologic states have been at least contributory. Causal relationship of injury to the

<sup>1</sup> W. L. Estes, *Keen's Surgery*, 1910, v, 915 et seq.

<sup>2</sup> *Ibid.*

<sup>3</sup> A. de Lapersonne, *Bulletin de l'Académie de Médecine*, Paris, Dec. 30, 1919 (abstracted in *Jour. Amer. Med. Assoc.*, Feb. 14, 1920).

<sup>4</sup> Sir William Osler, *The Principles and Practice of Medicine*, 1916, p. 583.

<sup>5</sup> J. Louis Ransohoff, *Annals of Surgery*, Oct., 1915, vol. lxii, No. 4.

pathology found after injury may be difficult to prove; as in the 2 cases of acute yellow atrophy of the liver ascribed by Ascarelli<sup>1</sup> to a blow on the testes and contusions of the scalp and abdomen respectively; and insufficiency of the aortic valves with incipient hypertrophy of the heart reported by Ranelletti<sup>2</sup> as having followed a blow on the chest by a falling wooden door. Glancing over Baudry's<sup>3</sup> interesting volume on the medicolegal aspect of eye injuries one is appalled at the great variety of pathologic conditions that may follow trauma to this most important organ. A blow on the head may cause such grave eye pathology as subconjunctival dislocation of the lens,<sup>4</sup> melanosarcoma of the choroid and endothelioma of the dura mater,<sup>5</sup> or cystic sarcoma of orbit.<sup>6</sup> Simple collision of one person with another has caused dislocation of the lacrimal gland.<sup>7</sup> "After an injury to the head the loss of smell (anosmia) may be the only symptom."<sup>8</sup> Contusion with or without laceration of the external ear (auricle) may cause an effusion of blood beneath the perichondrium or an acute perichondritis. In either case the appearance is nearly the same. "The injured region is occupied by a somewhat spheric tumefaction, the normal outline entirely disappearing."<sup>9</sup> This condition may clear up completely, but very often goes on to complete collapse of the cartilage of the external ear, resulting in the permanent deformity commonly known as "prize-fighter's ear." Rupture of the ear drum, with or without subsequent infection, may follow head injury, and deafness often occurs after cranial trauma. Baginsky<sup>10</sup> believes that it is difficult to give an opinion upon accidental injuries to the ear; that no certain opinion can be given as to the duration of the disability.

As the result of a railway accident a hernia may be rendered irreducible, inflamed, incarcerated or strangulated, or it may rupture. Hemorrhage may take place from a gastric ulcer or cancer or perforation, may occur. The same is true of intestinal ulcer. Bleeding may occur from the rectum if there is an ulcer or cancer and in cases of obstructive disease of the liver. Hemorrhage from the kidney may occur in cases of renal calculus, Bright's disease, renal tuberculosis, and from the bladder in cases of stone and of prostatic hypertrophy. Hemoptysis may take place if phthisis exists. Bleeding may occur from a fibroid tumor of the uterus. A limited area of tuberculosis in any part of the body may become active and may be diffused. In a person with a

<sup>1</sup> A. Ascarelli, *Semaine Medicale*, Oct. 18, 1905.

<sup>2</sup> Ranelletti, *The Lancet*, Dec. 2, 1911, p. 1571 (abstract).

<sup>3</sup> S. Baudry, *Injuries to the Eye in their Medicolegal Aspect*, 1900 (translated by A. J. Ostheimer, Jr., and revised and edited by C. A. Oliver with an American adaptation of the legal chapter by C. Sinkler).

<sup>4</sup> Eberhardt, *Ophthalmic Record*, Sept., 1905 (abst. by Wood in *Pract. Med. Series*, 1906, vol. iii).

<sup>5</sup> deSchweinitz and Shumway, *Ophthalmic Record*, July, 1905, pp. 311-315 (abst. *Ibid.*).

<sup>6</sup> H. Hansell, *Ophthalmic Record*, July, 1905 (abst. *Ibid.*).

<sup>7</sup> Crowder, *Ophthalmic Record*, Sept., 1906 (abst. *Ibid.*).

<sup>8</sup> Sir William Osler, *The Principles and Practice of Medicine*, 1916, p. 1028.

<sup>9</sup> E. B. Dench, *Diseases of the Ear*, 1919.

<sup>10</sup> B. Baginsky, *Berliner Klinische Wochenschrift*, Sept. 11, 1905.

movable kidney Dietl's crisis may occur. Strumpell<sup>1</sup> seems alone in believing that traumatism is a comparatively frequent cause of multiple sclerosis of the brain and spinal cord. Most observers have never seen a single case of multiple sclerosis in which injury could be suspected as causal. After railway accident paralysis may occur in the victims of arteriosclerosis. Brissaud<sup>2</sup> in his nineteen years of service as medical expert for railway companies employing 14,000 workmen has never met with a single case of authentic traumatic general paralysis among the many cases of injury that he has examined. Suppression of urine and uremia may arise in those afflicted with Bright's disease, and coma or gangrene, in diabetics.

A railway accident may be responsible for an aneurysm, rupturing the intima over a weak spot in the vessel. An existing aneurysm may be enlarged or ruptured. Valvular heart disease or dilated heart may be aggravated and sudden death may occur. Rheumatic or gouty inflammation may be greatly aggravated.

"Trauma, I believe," says Ransohoff,<sup>3</sup> "is often the direct cause of renal mobility." This author then states that he is aware of 3 cases of movable kidney so caused. Kelly and Burnam<sup>4</sup> "are convinced that a considerable number of patients developed movable kidney as a result of traumata," and quote Küster as saying that falls are liable to produce movable kidney in women, whereas in man the kidney itself may be injured by a fall, but is not dislocated. A floating kidney or spleen may be dislocated and firmly wedged in an abnormal situation. Neuroses may be aggravated or transformed, or apparently cured neuroses may be again aroused. Cole<sup>5</sup> says that "Trauma, or injury to the brain, from a fall or blow, with or without fracture of the skull or laceration of cerebral tissue, necessarily leads to some mental affection, but rarely do such cases become inmates of asylums. Injury to the head or body generally sometimes lights up a tendency to periodic insanity, epilepsy and general paralysis, and it causes so-called 'traumatic neurasthenia' (hysteria), the relationship in other cases being obscure and often associated with mental shock. Injuries of various kinds are associated, as causes of insanity, with other factors in 5 per cent. of male and 1 per cent. of female admissions." Dana<sup>6</sup> says: "The present tendency of neurology is to deny the existence of any special nervous affection produced by trauma or shock. There may follow from these causes: (1) Surgical injuries; (2) neurasthenic and morbid psychic states; (3) hysteric states; (4) hemorrhagic, inflammatory, and degenerative diseases; (5) combinations of the foregoing. These troubles may follow not only railway but other injuries, but are

<sup>1</sup>Strumpell, *Ztschr. f. Neurol.*, Bd. xii (quoted by Elsner in *Monographic Medicine*, 1916, vi, 909.

<sup>2</sup>Brissaud, *St. Paul Medical Journal* (abstracted in *The Railway Surgical Journal*, Jan., 1908).

<sup>3</sup>Joseph Ransohoff, *Keen's Surgery*, vol. iv, p. 206.

<sup>4</sup>Kelly and Burnam, *Diseases of the Kidneys, Ureters, and Bladder*, 1914, i, 479.

<sup>5</sup>R. H. Cole, *Mental Diseases*, London, 1919, p. 97.

<sup>6</sup>C. L. Dana, *Text-book of Nervous Diseases*, 8th ed., 1915, p. 533.



especially liable to follow those associated with intense fright. Traumatic neurasthenia, or "traumatic neurosis," "railway spine," does not differ from forms of neurasthenia produced by other causes, except that with it there may be certain sprains and surgical troubles and some morbid mental condition." "It is a well-known fact that traumatism may excite, in the predisposed and the infected, locomotor ataxia, inebriety, insanity, or may lead to the development of a cerebral tumor."<sup>1</sup>

Burr<sup>2</sup> declares: "Injury, however, has never been the only apparent external predisposing cause in the patients whom I have seen. In every one alcoholism, syphilis, sunstroke, arterial disease, serious irregularities of life, or some severe mental or emotional stress has been present. In other words, in all cases I have seen, beginning years after injury to the head, other causes in addition to the trauma have existed." "There is no characteristic type of posttraumatic insanity."<sup>3</sup>

We are convinced that traumatism frequently causes a disastrous change in character, that some of these cases become actually insane, and that such an insanity is often of a confusional nature, and characterized by lack of control and outbreaks of impulsive violence.

Traumatism may cause arteriovenous fistula (arteriovenous aneurysm, varicose aneurysm, aneurysmal varix). In intestinal stenosis obstruction may arise following trauma. Trauma may rupture varicose veins of the leg or varices elsewhere; it may inaugurate a cutaneous ulcer; it may cause Ludwig's angina; it may be responsible for necrosis of the pancreas, acute laryngitis, stricture of the larynx,<sup>4</sup> acute Bright's disease (Osler), cancer of the liver, diabetes insipidus, chronic dry pleurisy (Osler), paralysis agitans, myositis ossificans, polioencephalitis, peritonitis in children (Osler), tuberculous peritonitis, pericarditis, epithelial cyst,<sup>5</sup> gas gangrene,<sup>6</sup> peritonitis of the lesser peritoneum, venous thrombosis, tearing loose of the whole left lobe of the liver—caught between the buffers of a train. Multiple osteomata may follow trauma and actinomyces has been known to ensue after injury. Enchondromata, exostoses, plexiform angiomas, as well as certain other neoplasms and hypertrophies may arise after trauma.

In order to establish the relationship between a single trauma and a tumor Ophüls<sup>7</sup> make these rules: 1, the occurrence of the trauma must be proved; 2, the trauma must have been severe enough to appear effective; 3, the growth must develop at a place likely to have been injured by the trauma; 4, it must be reasonably certain that the traumatized part was normal before the accident; 5, the time lapsing between the trauma and the appearance of the tumor must

<sup>1</sup> C. L. Dana, *Text-book of Nervous Diseases*, 8th ed., 1915, p. 533.

<sup>2</sup> Charles W. Burr, *Trauma of the Head as a Cause of Insanity*, Jour. Amer. Med. Assoc., Jan. 5, 1907.

<sup>3</sup> Ibid.

<sup>4</sup> B. H. Wood, Jour. Tenn. State Med. Assoc., Sept., 1918 (Abst. by Shambaugh in Pract. Med. Series, 1919, vol. iii).

<sup>5</sup> L. Buerger, *Annals of Surgery*, Aug., 1907.

<sup>6</sup> Vincent and Stodel, *Presse Med.*, April 5, 1917. (Abst. by Ochsner in Pract. Med. Series, 1918, vol. ii).

<sup>7</sup> Ophüls, *California State Jour. Med.*, Feb., 1921.

agree with our scientific experience in the rapidity of the development of the particular kind of tumor under consideration.<sup>1</sup>

Kurt Muller in 1895 first called attention to the fact that renal calculi may follow injury to the spine, and Hollander<sup>2</sup> quite recently has ascribed this phenomenon to the paralysis of the renal pelvis and of the ureter, following directly from injury to the spinal column.

Trauma may be followed by sarcoma or carcinoma, not unusually by the former, seldom by the latter. Tumors may be stimulated to advance with increased activity because of bruising. Trauma may cause a benign tumor to become malignant, a fibroma to become sarcomatous, or a papilloma to become carcinomatous. These are but a few of an almost infinite number of conditions possible following injury.<sup>3</sup>

## SIMULATION

The question of simulation is discussed in another section. It suffices to say here that simulation of visible trouble is rarely practiced, the chief field for fraud being nervous conditions and subjective states. Following an accident a patient may claim that his mental processes have been impaired and that he cannot concentrate his mind on his work or add up figures, etc. Simulation may be unconscious, a slight injury acting as a hypnotic suggestion, a person believing, for instance, that he is paralyzed. Simulation is often conscious and is practised for dishonest purposes. It may be very difficult to make a diagnosis of malingering. Nearly every patient dwells on the litigation, becomes highly introspective, and is very prone to exaggerate symptoms. After an accident a person may allege deafness, unilateral or bilateral, or blindness. The symptoms presented by a simulator are usually added to from time to time, the individual gathering suggestions from repeated examinations. The symptoms often vary as the case goes on. Some clever simulators have kept themselves under the influence of a drug for prolonged periods. Others have exhibited old injuries and claimed them as of recent origin (spinal curvature, uterine displacement, loose joint in an acrobat). Some have produced lacerations mechanically or with chemical irritants and have kept them from healing. Collie<sup>4</sup> tells of a person who tried unsuccessfully to simulate syncope. The same writer calls attention to the practice of substituting an afflicted man in place of the would be collector of damages—the latter remaining out of sight of the medical examiner. Collie also states that when a malingerer is having a "fit" he takes care never to injure himself. Batten<sup>5</sup> states that "any malinger-

<sup>1</sup> Editorial in Jour. Amer. Med. Assoc., August 6, 1921, p. 466.

<sup>2</sup> E. Hollander, Berliner Klinische Wochenschrift, Dec. 1, 1919. (Abst. Jour. Amer. Med. Assoc., April 24, 1920).

<sup>3</sup> For further discussion of the relationship between trauma and malignant disease see editorial, Jour. Amer. Med. Assoc., Aug. 6, 1921, p. 466, and James Ewing, Neoplastic Diseases, 2d ed., 1922, p. 110.

<sup>4</sup> R. J. Collie, Accidents in their Medico-legal Aspect, edited by Douglas Knocker, London, 1910, p. 550 et seq.

<sup>5</sup> F. E. Batten, Accidents in their Medico-legal Aspect, edited by Douglas Knocker, London, 1910, p. 576.

ing of paralysis from injury to a nerve would be readily detected by the distribution of the supposed paralyses, since it is not likely that the muscles supplied by any given nerve would be known to the malingerer; by the electric reactions and by the reflex movements produced by the application of painful stimulation. This does not take into consideration the wilful infliction of wounds and pressure, both of which are possible. It is easy for him to complain of intense and persistent pain in the course of the nerve. In true neuralgia the nerve is usually tender and sensitive to touch and the course of the nerve is not likely to be known to the malingerer."

The simulated picture lacks something—the part is often overacted, and the condition varies somewhat from examination to examination. In cases of pretended paralysis or joint stiffness or aphasia the diagnosis will be cleared up by giving ether, for while the patient is becoming unconscious he can no longer act a part, and will move the supposed stiff joint or paralyzed limb, or he will talk correctly in spite of a pretended aphasia. Hoover's sign<sup>1</sup> may be used to detect malingering and functional paralysis of the lower extremities. If a man claims there is palsy of the left leg we tell him to lift the right foot off of the bed while the leg is extended. If the left leg is not in a state of palsy the left heel will dig into the couch as the right leg and thigh are extended. The tendo achillis of the left side can be felt to become tense during the effort with the right extremity. Normally the left heel makes a point of opposition while the right is being lifted. Many other tests are set forth in text-books. Hansell<sup>2</sup> has written an interesting article on the diagnosis of "Hysterical and Simulated Blindness." Brownfield<sup>3</sup> has recently invented an electric hearing test to detect malingering, and Callahan<sup>4</sup> describes an ingenious hearing test to detect vocal malinger.

An individual may allege that an old condition is a recent one produced by the accident. Occasionally such a fraud is attempted by a person who has long possessed a hernia. Can a recent hernia be distinguished from an old hernia? This subject has been most instructively discussed by Kaufmann.<sup>5</sup> He makes an inquiry as to when a hernia is to be regarded as an accident for which an insurance company must pay. An accidental hernia appears suddenly; is produced by direct or indirect violence or a severe strain; is accompanied by tenderness about the ring and by severe pain which forces the man to suspend his work. The pain is always severe, and if the individual has not complained of it at the time and has not sought medical help, our suspicions should be aroused. Kaufmann sets forth the following facts regarding a recent

<sup>1</sup> C. F. Hoover, A New Sign for the Detection of Malingering and Functional Paresis of the Lower Extremities, *Jour. Amer. Med. Assoc.*, 1908, li, 746.

<sup>2</sup> Howard Hansell, *Annals of Ophthalmol.*, Oct., 1907 (Abst. by Wood in *Pract. Med. Series*, 1909, vol. iii).

<sup>3</sup> R. R. Brownfield, *Jour. Amer. Med. Assoc.*, March 2, 1918.

<sup>4</sup> J. T. Callahan, *Boston Med. and Surg. Jour.*, Sept. 26, 1918.

<sup>5</sup> Constantin Kaufmann, *Handbuch der Unfallverletzungen*, Stuttgart, 1893. *Die Bruchfrage*, *Monatsschrift für Unfallheilkunde*, Leipzig, Oct., 1918.



hernia: the hernia is never larger than a hen's egg, and is either interstitial or projects only a little from the external ring; it does not return spontaneously even when the patient lies down, and can be reduced only by taxis; when once it has been reduced, it will very rarely reappear unless the patient coughs or strains; after reduction the ring will just admit the point of the index-finger; there is almost never a hernia on the opposite side. "The signs of an old hernia," according to Moorhead<sup>1</sup> are: "absence of ecchymosis, and the large size (bigger than an almond after a few weeks); laxity and regularity of the ring (admitting more than one finger-tip); the presence of thickening or other signs of pressure; dermatitis from tension within or without; the absence of pigment or hair as from a truss; general thickening of the parts; easy reducibility and reproduction; freedom from pain on manipulation and the capacity of the patient to accommodate his movements to the swelling; general laxity of the involved or adjacent muscles; bilaterality or other herniæ; associated varicocele, hydrocele, or other abnormalities." "Scrotal herniæ take a long time to form and are never seen within a few weeks of any alleged causative factor."<sup>2</sup> Moorhead had a patient who was caught between a moving subway train and the platform and received a long wound over the crest of the ilium. A hernia through Petit's triangle subsequently developed in the scar of this wound, "thus constituting a true traumatic postoperative hernia." "For an accident to be related (quoting the same author) to the subsequent development of any variety of hernia the following factors are needed:

"1. No previous hernia existed, as determined by definite prior examination.

"2. The parts are anatomically sound.

"3. The injury must have been close to the herniated zone.

"4. The violence must have been adequate.

"5. The symptoms must be of the type seen in abdominal shock with appropriate local signs (pain, swelling, ecchymosis, etc.).

"6. The hernia must appear very promptly; after two weeks it is often impossible to say just how long it has existed.

"7. No sign of old origin must exist.

"8. No other hernia on the opposite side or elsewhere must be in evidence, thus ruling out the so-called 'hernia tendency.'"<sup>3</sup>

Krymow<sup>4</sup> succeeded in producing artificial herniæ on the cadaver, and Von Bergmann<sup>5</sup> in 1904 discussed hernia self-induced by means of an instrument resembling a kid glove stretcher.

Fog<sup>6</sup> gives the histories of 45 persons injured in a railway accident. There were 4 whose minds alone were affected. There were 26 with

<sup>1</sup> J. J. Moorhead, *Traumatic Surgery*, 1917.

<sup>2</sup> *Ibid.*

<sup>3</sup> *Ibid.*

<sup>4</sup> Krymow, *Arch. Klin. Chir.*, 1910, vol. xci, Heft 3. (Quoted by Coley in *Keen's Surgery*, vol. vi.)

<sup>5</sup> von Bergmann, *Berliner Klin. Woch.*, 1904.

<sup>6</sup> J. Fog, *The Lesions in a Railroad Accident*, *Ugeskrift for Laeger*, Copenhagen, Jan. 29, 1920. (*Abst. Jour. Amer. Med. Assoc.*, March 20, 1920.)

fractures and there were 78 fractured bones in the 40 that were killed at once. All the injured complained of intense thirst and cold, but they said they did not feel pain from their injuries. The screaming was from fright. Meisen compares the lesions and traumatic neuroses with those of the war, saying that the mental condition was exactly like that of shell shock, and also the physical shock seemed to be the same (pallor, chilliness, imperceptible pulse, and mental confusion). The latent period before the mental phenomena developed was also like that observed in the war wounded or shell shocked. He emphasizes the necessity for distinguishing between shock conditions and those due to internal hemorrhage.

One of the oldest medical reports in English of injuries from a railway accident seems to be that of Thomas Buzzard.<sup>1</sup> This practitioner writes of 3 cases: A pregnant woman, aged forty, who "was pitched over the division in a second-class carriage into the next compartment"; a young man, aged twenty-three, who "was in a second-class carriage, next to the engine, which was hurled down the embankment"; and a young lady, aged twenty-two, who "remembers nothing till she found herself in a cab." The same writer,<sup>2</sup> in his article *Cases of Injury from Railway Accidents, etc.*, says: "Railway accidents present such varieties that it would be impossible in my short space, even if it were necessary, to enter upon the question of the mode in which life is endangered in each." More than fifty years later we cordially agree with him and have made no attempt to analyze the railway's almost infinite possibilities for accident. As it is impossible to indicate, even approximately, the multiple and complex agents which may cause bodily harm in a railway accident, we have confined ourselves, almost exclusively to facts and events recorded in the literature.

<sup>1</sup> Thomas Buzzard, *The Lancet*, Oct. 14, 1865, ii, 443.

<sup>2</sup> *Ibid.*, March 30, 1867, i, 389.

# INJURIES AND DISORDERS OF THE NERVOUS SYSTEM FOLLOWING RAILWAY AND ALLIED ACCIDENTS

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INJURIES received in railway accidents are among the more recent accessions of pathology. The time is within the memory of most when all civilized countries had not become bound in steel, and it is only a few years since railway travel has assumed such extensive proportions and that the resulting catastrophes have created a medical literature of their own. Improved mechanical appliances, perfected systems of signals, and military discipline among employees tend to diminish the accident percentage. But these advances are more than counterbalanced by the constantly increasing traffic on all kinds of surface transportation, so that the number of persons killed and injured becomes each year larger. The Seventh Annual Report of the Interstate Commerce Commission shows the total number of persons killed and injured on railroads in the United States during the year 1888 to be 31,170. This number increased each year until 1893, the World's Fair year, when it reached 47,729. From that time on to 1920, at intervals of five years, the figures run as follows:

Year.	Employees.		Passengers.		All others and total.
	Killed.	Injured.	Killed.	Injured.	
1898	1958	31,761	221	2,945	47,741
1903	3606	60,481	355	8,231	86,393
1908	3405	75,006	253	10,311	104,348
1913	3715	171,417	403	16,539	211,272
1920	2667	149,602	264	8,456	175,266

## STATISTICS FOR THE TOTAL MILEAGE AND NUMBER OF PASSENGERS CARRIED

Year.	Mileage.	Passengers carried.
1900	193,345	576,831,251
1910	240,438	971,683,199
1920	253,152.17	1,234,222,889

The total number of railway employees in 1920 was 2,031,927.



Railway collisions or derailments are particularly adapted to cause every variety of injury. Bruises and crushes of the flesh, cuts from broken glass, bruises and scalds from fire and escaping steam, fractures, dislocations and twists of bones and joints, decapitation, dismemberment, and, in fact, wounds of almost every description, may induce death, or cause disabilities and disfigurements of all degrees. To the physical injuries incurred in such disasters is added the important factor of mental shock. It is needless to emphasize how lasting must be the terrible impression left on the mind by the suddenness of an accident, the cries of the wounded, the noise of escaping steam, and the uncertainty and terror which render railway accidents among the most harrowing to which mankind in civil life is exposed.

The railway, however, no longer furnishes either physical or mental injuries which cannot be duplicated in many other ways. The present age is mechanical, and new inventions and elaborate machinery are constantly furnishing additional means of producing bodily injury and psychic shock. Accordingly, in treating of injuries consequent upon accidents it is not possible to restrict accidents to such as occur upon railways. Shock and concussion, however they be brought about, may induce the same nervous conditions. For example, "railway spine," or traumatic neurosis, or nervousness, as it should be plainly called, is not necessarily limited to persons who have come to grief on the railway; it may equally be induced by a blow on the back or a fall on a slippery pavement, or it may appear as the result of fright alone in individuals who received no bodily harm whatever. But since injuries received on railways so frequently become the subjects of litigation, and since disasters on transportation lines form the largest class of accidents, it is to them that the chief medicolegal interest is attached.

To detail general surgical injuries due to accidents, in either their clinical or legal aspects, does not fall within the limits of the present volume. Such descriptions must be sought for in works on surgery. In general, compensation for such can easily be adjusted, at least so far as the medical conditions are concerned. The loss of a limb, or of an eye, with the attendant disability and expense, requires no expert evaluation. There are, however, many intricate medicolegal questions arising from purely surgical injuries. Of these may be mentioned diseases following lacerations of internal organs, the effect of slight traumata upon persons whose recuperative powers have become impaired through dissipation or disease, and the influence which may be exerted on the growth of tumors by blows or concussion. For the determination of the legal values of such cases pathology offers no definite rule; individual decisions must be arrived at for each case, although to ensure equitable adjustment it is always essential to ascertain the physical condition of the person before the accident. If this cannot be done, the chances of error by "substitution of origin" are very great.

The chief medicolegal interest in accidents centers about the disorders of the nervous system which occur as their alleged result. There are several reasons why this should be so. In the first place many

subjective nervous affections result from accidents in which the patient has received no physical injuries whatsoever, or only such as are of a trivial character.

The fact that shock alone, or shock combined with slight physical bruising with subsequent depression of morale, may cause serious disorders of the nervous system, explains the increased proportion of nervous to other disorders resulting from accidents; for in general accidents many escape without severe bodily harm, while very few are so fortunate as to evade the severe mental commotion to which such disasters invariably give rise. The results of mental shock and fright are however, usually evanescent, and after a few hours or days the individual who has experienced them may entirely recover from them.

On the other hand, to quote Sir John Collie, "it is unfortunately the experience of most physicians that nervous people, who are given to self-examination, unconsciously foster subjective sensations which their stronger and better balanced neighbors would ignore. The idea of illness or a possible injury and its consequences obsesses them. Their pains are real, but often psychic. Such people are victimized by their unstable nervous system. Too often they make no stand against morbid introspection. Frequent gossips with others who have found themselves in similar circumstances, continual rehearsals of the illness or the accident, and the oft-repeated recital of sensations, all act as co-operating factors in bringing about a condition of autosuggestion, in the diagnosis and treatment of which the medical profession is lamentably backward."

Donaldson says that there are 10,000,000 nerve-cells in the gray matter of the brain. The spinal cord is profusely supplied as well, and each cell has a number of prolongations which connect it with other cells, thus forming a unity in the cellular aggregation.

In this minute and complicated structure are situated the highest of the mental functions and the mainsprings of physical action. Ignorance becomes especially conspicuous in those nervous disorders known as functional, the symptoms of which are mainly subjective. There is no longer any doubt that changes of some kind underly the clinical manifestations—there must be organic alterations causing or paralleling all psychic phenomena—but what they are histology and chemistry have as yet failed to disclose, and they must still be known by the symptoms they present, and not by the fundamental conditions upon which they depend. In a very large number of the suits for damages following railway and allied accidents the claim is based upon the incurrence of functional nervous affections; and what has just been said will in part explain the frequent unsatisfactory decisions in such cases. It is in the functional rather than in the definite organic diseases that the difficulty arises.

When a man, after a severe fright or concussion, without having received serious physical wounds, develops a chain of symptoms of a largely subjective character, it is difficult to believe and often difficult to prove that the sufferer is not an impostor who is feigning disease or exaggerating trivial symptoms in order to make money. In many cases,

however, the symptoms, although indefinite and difficult of objective proof, are real and to a certain extent beyond control, and do not *necessarily* disappear after the suit for damages has been decided—that is, when motives for deceit no longer exist.

To the inherent clinical difficulties of this subject the spirit of the times has added others. New laws for workmen's compensation have been passed in every state in the Union, and only two of these (New Hampshire and Arizona) are as old as 1912. While there are variations of execution, courts or commissions, the laws are much the same, no allowance being granted unless disability has lasted from ten days to a month in some states, and then taking up from the beginning, full pay at first, graduated after a lapse of time according to the injury and the home conditions of the workman. In no case, however, does he receive full pay for long, nor is he likely to get relief from other public sources. The Industrial Insurance Resumé for 1910 is as follows: Premium income, \$109,510,535; claim payments, \$37,143,007. For 1920: Premium income, \$254,685,000; claim payments, \$69,586,000.

In England matters are further complicated by the fact that several agencies may be giving aid at once, and so the victim of an accident may be making more than he normally could.

In Germany the system of long-continued support allows malingering to an extent that constitutes a menace to society.

The bringing of damage claims for personal injuries has, for that matter, everywhere assumed a very considerable sociologic importance. Since the appearance in 1866 of Erichsen's book on "Concussion of the Spine," in which were published the sums of money paid for spinal injuries, the number of such suits, and the amounts involved, have been steadily increasing. Ten thousand dollars is now considered an ordinary claim for the most trivial injuries, and after every accident many railway companies send their representatives to the scene of the disaster, who there open a claim bureau, and forestall the inevitable by notifying injured employees and passengers to present their claims.

It of course is no more than justice that persons hurt through another's negligence should be appropriately recompensed for loss of time or disability. It is, however, unavoidable that the temptation of bringing spurious or unjust claims should be very great. In most large cities there are well-known members or associations whose sole business is the prosecution of damage claims. "Runners" watch crowded crossings and hasten to the scene of any accident. They follow their victims to the hospital or to their homes, and solicit, either in person or by letter, the management of the claim. Few injuries are too trivial to be refused by these "accident lawyers," and many of the claims are absolutely fraudulent. In some places this business has assumed such proportions that it has been aptly called "speculation in damage claims."

In neurology, as in other branches of medicine, many men appear as experts who are distinctly unqualified for the position to which they lay claim. It is largely through such individuals that the term "expert testimony" has gained the some time synonym of testimony for the side



which pays, or will pay if it win. None more gladly than the great body of physicians will welcome some law by which this question may be adjusted, so that physicians of recognized standing and great hospital experience could be appointed by the courts to give unbiased opinions based upon sound learning.

From what has been said it will be seen that nervous disorders following accident are associated with many difficulties, both in and out of court. Each man has, if he be dishonest, his price. Each honest man has, on the other hand, his saturation-point of trauma; a succession of injuries may break down his morale and give rise in him to fixed fear-trends which put an end to his earning capacity, sometimes, and always reduces his usefulness.

Such a case was that of a caisson worker who had lost at different times an eye, a finger, and had been injured otherwise. Although he was a young man, the last accident, a trivial one, released the cumulative consequences of the others, and he became a typical case of traumatic nervousness. The details of this case are not of interest, but the main features confirm the idea that specially trained minds are needed for this kind of diagnosis, and that time and money would be saved in the end to the victim, whether he be the individual, the corporation, or the public, by using the utmost care in the selection of diagnosticians.

Inasmuch as in functional nervous diseases the evidence of organic lesions are absent, and the diagnosis is one by exclusion, a familiarity with organic symptoms and a knowledge of the ordinary results of organic injuries afford the surest means of diagnosis of functional affections. To these considerations we shall now proceed.

## SYMPTOMS OF ORGANIC NERVOUS DISEASES

**Paralysis** is a symptom, not a disease. When of organic origin it is the result of interference with the motor path anywhere in its course from cortex to periphery. The motor path consists of an upper and a lower segment. The upper segment is composed of the main processes of the nerve-cells of motion which are located around the fissure of Rolando in the brain cortex. The processes descend through the brain in a well-defined bundle, to communicate with similar cells in the spinal cord. Before reaching the spinal cord they cross, for the most part, so that the prolongation of a motor cell in the right side of the brain has its termination in the left side of the spinal cord, and vice versa.

The lower segment of the motor path is made up of the anterior horn-cells of the spinal cord and the main processes. The cells send out bundles of processes to the muscles. These bundles constitute the nerves. A voluntary movement is the result of some change in the cortical motor cell by which an impulse is liberated by the will of the subject and caused to descend the motor pathway to transmit its energy to a similar cell in the opposite side of the spinal cord. The spinal cord cell receives and transmits the stimulus through the peripheral nerves to the muscles,

and the resulting muscular contraction is a voluntary movement. Injury to the motor pathway in the brain causes paralysis of the opposite side. In places where the fibers are closely packed together and the path is small, a very slight lesion may cause a complete hemiplegia. By reason of the extensive area included by the motor cortex, small injuries there may be accompanied by monoplegia; and irritative lesions of this

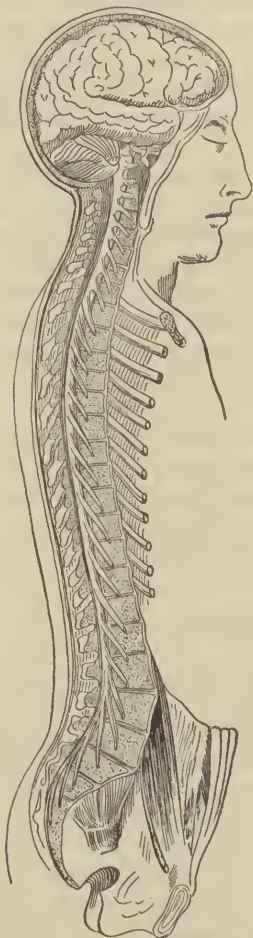


FIG. 165.—General view of the cerebrospinal nervous system (after Bourguery (Schwalbe)).

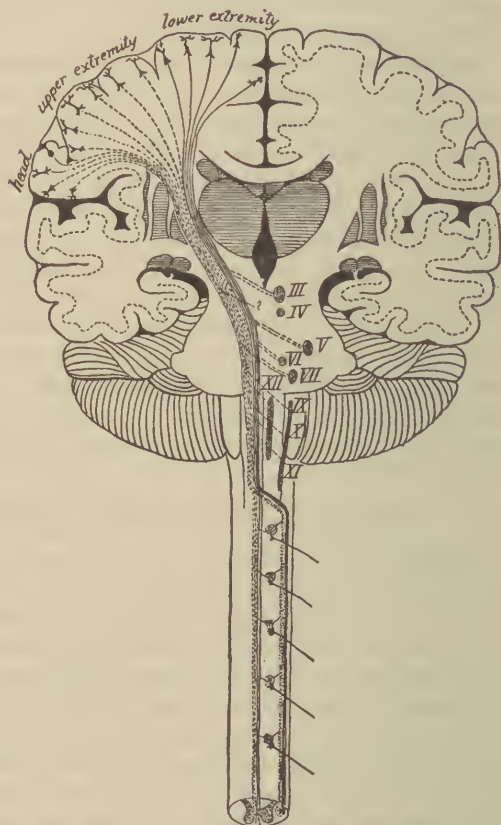


FIG. 166.—Schema illustrating the course of the cerebrospinal motor path (after Van Gehuchten).

region usually result in convulsions, as is seen in traumatic epilepsy. The tendency of cerebral paralysis, if life be spared, is toward partial recovery. The return of muscular power may be fairly complete, although usually associated with a characteristic rigidity of the muscles.

When the lower segment of the motor path—*i. e.*, the spinal cord





segments, and in each segment are collected, on the way to the brain, the nerve-fibers which come from certain well-defined areas of the skin; so that injury of any one segment will cause anesthesia in the cutaneous areas from which its own sensory fibers come, as well as in regions supplied by nerves entering the cord at the lower levels, but which become implicated in their passage through the infected segment. The segmental distribution of anesthesia is highly characteristic of spinal cord injuries and is altogether different from the irregular anesthetic areas found in hysteria, or the areas which follow the distribution of the peripheral nerves as seen in neuritis. In Fig. 167 are outlined the anesthetic

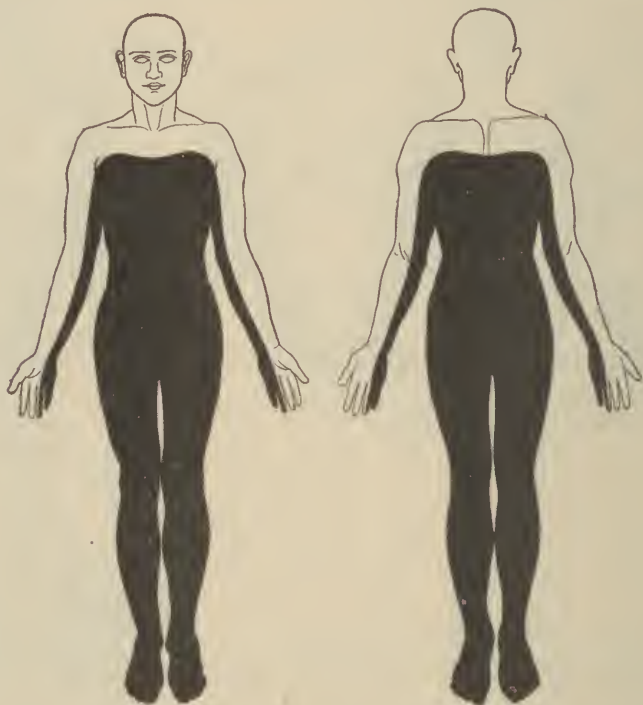


FIG. 168.—Showing the distribution of anesthesia resulting from a fracture of the cervical vertebrae, which compressed the eighth cervical segment of the spinal cord (personal observation).

areas of the different segments as arranged by Professor Starr. Figures 168 and 169 illustrate the type of anesthesia as it occurs in individual cases.

**Reflexes.**—Many of the so-called reflex actions which take place in the spinal cord are not independent, but are more or less under cerebral control. Over them the brain is said to exert an inhibitory influence. The phenomenon of the knee-jerk is illustrative of this. In health a gentle tap on the patellar tendon induces an extension of the leg, independently of any volition on the part of the person under examination. But when this procedure is tried on the paralyzed side of a hemiplegic,

the resulting movement is excessive. This is explained by the fact that the destruction of the cerebral fibers controlling the reflex arc has permitted an overaction of the spinal cord cells directly responsible for the movement. If the injury is to the spinal cord in the regions where the reflex is centered the reflex will be abolished.

Ankle-clonus consists in a rapidly alternating flexion and extension at the ankle, which is obtained by placing the hand on the sole of the patient's foot when the leg is extended, and sharply flexing the foot on the leg. This symptom is rarely seen except in injuries to the upper segment of the motor path.

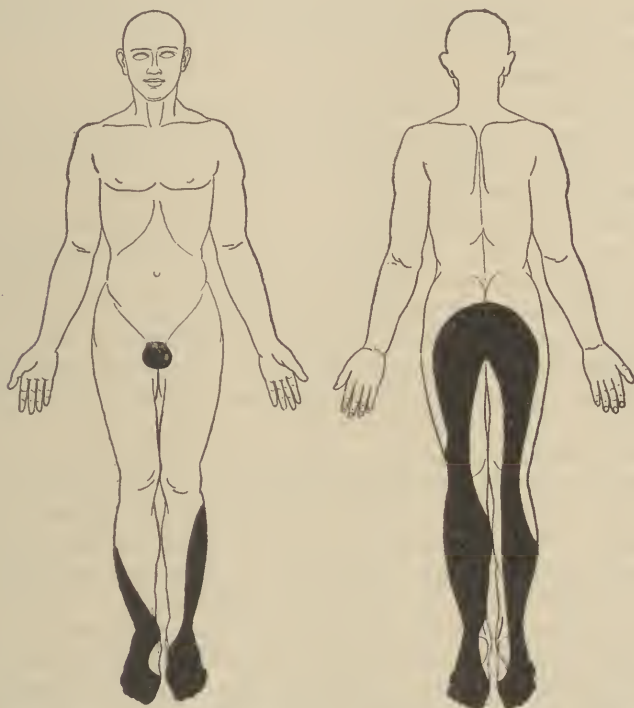


FIG. 169.—Showing the distribution of anesthesia resulting from a fracture of the vertebræ, which compressed the fifth lumbar segment of the spinal cord (personal observation).

Of the various reflexes, both superficial and deep, the knee-jerk and the plantar reflexes are of the chief diagnostic importance. Loss is of more significance than exaggeration, as many functional diseases are accompanied by exaggerated knee-jerk. Loss of knee-jerk in health is said to occur in one out of every 500 persons.

The plantar reflex is obtained by discreetly tickling the sole of the foot. Normally there follows an involuntary movement of the toes downward—*i. e.*, toward the stimulating instrument. Where a lesion of the motor tract exists, the movement of the great toe is upward and away from the instrument, and in quite characteristic cases the other

toes are separated at the same time and flexed slightly. This phenomenon is called the extensor type of plantar reflex, or Babinsky's sign. Its qualitative nature makes it especially valuable; it is never present in purely functional states, but is only produced by a deterioration in conduction in the motor tracts or their cerebral origins.

**Sphincter Control.**—The functions of the bladder and rectum, which are partially reflex, are almost constantly interfered with in injuries of the spinal cord. If the injury be above the segment controlling these functions, the disturbance may be temporary; if, as very frequently happens, the segments controlling the bladder and rectum themselves are destroyed, there results a permanent paralysis of these organs. The condition of the bladder and rectum are of the highest importance for diagnostic purposes. It is unusual for them to be interfered with in trauma of the brain.

Incontinence of urine and feces are not produced by hysteria. Urinary retention may temporarily occur in hysteric conditions. Complete division of the spinal cord results in automatic evacuation of the bladder at periodic intervals.

**Trophic.**—The most important trophic centers are probably situated in the spinal cord. By trophic function is understood the power which controls nutrition. When the trophic centers of the spinal cord are destroyed the muscles waste and degenerate, and the condition of skin, hair, and nails becomes abnormal. Bed-sores are the most common and distressing results of interference with trophic function through spinal injury, of which they form an important symptom. Bed-sores are unknown in hysteria.

**Pain.**—Remarkable as it may seem, pain in injury of the central nervous system is not a pronounced symptom. In morbid processes of chronic nature, such as tumors or the degenerative diseases, it may be of terrible severity. It is rarely so in destruction of nervous tissue caused by hemorrhages or fractures of the bones. The pain consequent upon injuries to the nerves after their exit from the spinal cord, if the injury be of an irritative character, may be intense.

**Electric Reaction.**—By referring to the diagram it will be seen that the motor path consists of two segments: one going from the cortex to the spinal cord, the other from the spinal cord to the muscles. Injuries to the first of these cause no change in electric reactions, but injury to the second, namely, the spinal cord cell or the peripheral nerve, may cause what are known as degenerative reactions. They consist in an absence of response, or diminished response, to the faradic current, or a change in the response to galvanism, so that peripheral nerve and spinal cord injuries are, and cerebral paralyses are not, accompanied by the reaction of degeneration. In the functional diseases resulting from accidents changed electric reactions do not occur.

**Cerebral Symptoms.**—In injuries of the spinal cord or nerves consciousness is usually retained, while severe injuries to the head almost always produce unconsciousness. It is usually impossible to tell, from the coma following head injuries, if there has been a structural lesion of



the brain. For the decision of the question most reliance is to be placed upon the presence of local injury symptoms. After a blow on the head a man may remain unconscious for several days and finally recover without any evidences of cerebral trouble; or the coma following such an injury may be shorter, although permanent paralysis result. In addition to coma the cerebral symptoms following traumas are of too great variety to be described here. None of them is necessarily indicative of permanent organic brain injury, although it is generally true that the more serious the cerebral symptoms, the more probable the existence of such a condition. Any of the traumatic neuroses may be developed without the occurrence of immediate brain symptoms.

**Shock.**—Psychic, or nerve, shock is the effect produced upon the mind by sudden and painful emotional influences. Physical shock is a condition of acute depression of the functional activity of the general nervous system. It is a usual accompaniment of severe injuries of any part, although it may follow accidents of a trifling nature. It usually occurs immediately after the accident and continues for a varying length of time. Consciousness is not lost in this condition, but the patient is depressed or apathetic. The face is pale, the skin moist and cool, the pulse is rapid and feeble.

Into the other general symptoms, which follow accidents or which may complicate injuries, it will be impossible to go. It may be indicated, however, in closing this brief description of the more important symptoms of organic nervous disease, that any injury which causes laceration of tissue may be followed by infective processes. In such cases evidence of infection is superimposed upon focal symptoms. For the nervous system this is important as regards inflammation of the membranes which surround the brain and spinal cord and softening and suppuration of nervous tissue.

**Causes.**—The symptoms of traumatic organic nervous disease may be produced in a variety of ways. The central nervous system, being surrounded by bone, is protected against injury. The bony casing may, however, be penetrated by sharp instruments or projectiles, or it may be broken or dislocated and thus press upon or crush the delicate structures it surrounds. Stabs and gunshot wounds produce all kinds of injury. Fractures of the skull may be depressed and so crush the brain, or they may cause a laceration of the meningeal or cerebral vessels, hemorrhage from which is often sufficiently extensive to induce paralysis or cause death.

Injuries of the spinal cord are usually the result of fractures or dislocations of the vertebræ. The cord may be pressed upon or crushed and it or its membranes may be lacerated and bleed. Concussion, which does not necessarily produce immediate injury, was formerly considered a frequent cause of spinal cord and brain disease. Severe blows and falls upon the head, or accidents in which the body was thrown violently to and fro, were supposed to induce molecular changes in the nervous elements sufficient to account for the symptoms which so commonly result from such catastrophes.

Concussion as a cause of nervous disease, and again as a pathologic condition of the nervous system, is a much abused term. Concussion accidents, if they be sufficiently severe, may, of course, cause irreparable injuries to the brain or spinal cord. They are entirely capable of bringing about the same effects as are wrought by violence which is more directly applied. While unreservedly admitting the word as a designation for an occasional cause of organic nervous lesions, it is desirable to be much more conservative about assigning a place to concussion in pathologic anatomy. Most writers who sanction this latter use of the term understand by it a molecular derangement of nervous tissue, which occurs independently of laceration, pressure, or hemorrhage. The proof of concussion as a pathologic entity is very meager. There seems to be more probability of its existence in the brain than in the spinal cord. Head injuries are frequently followed by cerebral symptoms of so temporary a character that it is necessary to infer that the lesion is slight, whatever its character may be; and while the symptoms in reality may be due to minute hemorrhages or contusions of the cranial contents, it cannot be denied that they may be dependent upon a temporary disarrangement of molecules in nerve-fibers and nerve-cells. The onus of proof of such disarrangement in medicolegal cases should rest with the patient, and must depend not on vague general symptoms, but on symptoms and signs referable to a disturbed focal area of known physiologic function.

To the suggestibility of man, however, there is scarcely any limit, and the vague symptoms occurring after minor head injuries are more properly explained by self-pity, a sense of grievance, and wishful thinking induced by ignorant or gloomy medical or legal prognostications.

The spinal cord is very much more securely protected against injury than the brain. Probably no problem in medicine has received more attention than so-called railroad spine. Since 1866 it has attracted the attention of surgeons and neurologists; it has formed the topic of discussion in innumerable medical congresses; it has been investigated in the clinic, the dead-house, and the laboratory; paper has shown itself patient in recording speculations as to its merits; enormous sums have been paid for it in damage claims; yet, as a result of all this attention, there has not been recorded a single case which can be regarded as satisfactory proof of this condition.

In the earlier periods of history concussion of the spinal cord was confused with such general disturbances as neurasthenia and hysteria. At the present time such errors are inexcusable. There are still, however, some authorities who believe in localized concussion which gives rise to focal symptoms. The cases which are adduced in support of this view can all be more satisfactorily explained by the occurrence of hemorrhage in the spinal cord or by pressure upon the spinal cord by some of the structures which surround it.

During the war many cases of spinal injury occurred without the cord having been directly touched by the missile. In these the bullet passed near the cord, and usually struck the vertebræ with such force

as to cause a cord or meningeal hemorrhage. The writers saw several instances of deterioration of function in the posterior columns after bullet fracture of spinous processes. The localized energy of the blow, however, is not comparable to many civil injuries, and differential diagnosis is not difficult between such organic lesions and hysteric states, provided the examiner be intelligent and adequately trained for his work.

Without a preceding medical examination to the contrary, it is possible that some inconspicuous and unobserved symptoms existed before the accident, and that the injury has served only to intensify them. In fraudulent cases, pre-existing disease may be alleged as due to an accident. Since it rarely happens that a medical examination has been made just before a catastrophe, the testimony in the majority of such cases must be based upon a presumably good condition of health before the accident and upon such facts as may be known regarding the traumatic origin of the disease.

Injuries which stand, perhaps, in the causal relation to the chronic degenerative nervous diseases are physical rather than psychic. Head injury is a form of trauma usually ascribed by patients and patients' relatives as causative for traumatic dementia paralytica or general paralysis of the insane. Injuries of various parts of the body have been regarded as influencing the development of spinal cord diseases. While it is possible to say that severe psychic shock can aggravate chronic nervous diseases of organic character, to claim such power for purely mental influences would be an assumption lacking foundation both in pathologic observation and clinical experience; so that it can only be said of nervous shock in its relation to the development of chronic organic nervous disease that although it may be an etiologic factor, proof that it is so is lacking.

In many of the diseases of this class trauma has been placed among the causative agents, but in very few of them has such a causal theory been established. Syphilis is a most influential factor in the development of degenerative nervous disease, and it is remotely possible that an injury may arouse to activity a morbid syphilitic process which should otherwise have remained indefinitely latent. The history of syphilis or the evidences of existing syphilis should be sought for in all cases of chronic nervous disease of organic character apparently developed as a result of injury.

In short, the production of organic progressive degenerative nervous disease through injury is rare. Syringomyelia, which should be regarded as a clinical rather than a constant pathologic entity, may occasionally follow injury through petechial hemorrhages in the cord acting as irritant, and a factor in the production of spinal gliosis and cavity formation. Not infrequently trauma is blamed for the occurrence of disseminated sclerosis. Undoubtedly after this disease has begun, trauma, physical or emotional, has a decidedly accelerating effect in the growth of its symptoms, but that it can give rise to the disease *de novo* is not proved. We must remember that in the recent war many millions of men, all



of the age period in which multiple sclerosis develops, were subjected for some years to every variety and degree of injury and strain without the occurrence of any unusual amount of this disease in their ranks; were it true that multiple sclerosis is often produced by injury, there should have been, in the last seven years, a wide-spread epidemic of that ailment.

General paralysis of the insane, general paresis, or dementia paralytica is a disease which has had many important forensic relations. They arose, however, in the period of medical knowledge when the exact etiology of this disease was unknown. It is now certain that paresis is produced by the entrance of the organism of syphilis into the brain substance. Lacking this, paresis is impossible. It is not possible, however, to deny that injury, shock, or prolonged overwork or strain are capable of making the symptoms more fulminant than they otherwise would be, but it is possible to deny that these factors can give rise to the disease itself.

A similar general attitude is proper as regards the relationship of injury to tabes dorsalis or locomotor ataxia. This disease is only produced by syphilis acting on the posterior spinal roots and posterior spinal columns. However, while paresis is almost always a progressive condition ending in death, and therefore capable of being affected only in degree and speed by injury, tabes dorsalis may be comparatively benign for many years, and symptoms of a distressing character can be produced in a suitable subject by injury—symptoms which one is entitled to believe might have been postponed indefinitely had not injury occurred. The writers would instance the case of the driver of a high cart who had fixed pupils and no knee-jerks and no ataxia for years before a collision in which he was thrown to the street. On the very day, in fact the very hour, after the accident he was unable to stand without help. These acute ataxias, however, improve rapidly with rest and re-education; only rarely are they permanent.

**Epilepsy** frequently owes its origin to trauma, especially to injuries by which the skull was fractured, with resulting pressure on the motor cortex of the brain. It may appear immediately after the accident, or its appearance may be delayed for weeks and months. The attacks may simulate very closely those of idiopathic epilepsy, or if the source of irritation be localized the resulting spasms may have their beginning in the individual muscles corresponding to the portions of the motor cortex which have been pressed upon. The development of traumatic epilepsy does not imply any predisposition to the disease. In cases of traumatic epilepsy said to be due to falls on the head it is essential to determine whether the convulsions are *post hoc* or *propter hoc*. For an initial epileptic seizure may cause a fall on the head, and, having had no attacks of a similar character, the patient may claim, and himself believe, that the subsequent convulsions were due to the fall, whereas in reality the fall was caused by the unconsciousness resulting from the idiopathic epileptic seizure.

**Malignant Tumors.**—That they develop as a result of injury in a

certain number of cases is a well-established fact, but it is often difficult of demonstration. Very little is positively known of the etiology of tumors. All that can be said of traumatic influences in respect to their development is that injury may stimulate to morbid activity structures which are not present in a normal individual.

## FUNCTIONAL DISORDERS OF THE NERVOUS SYSTEM FOLLOWING ACCIDENTS

### **Their History, Classification, Nomenclature, and Causation.—**

So much confusion has existed concerning the appropriate nomenclature and proper classification of some of the functional diseases of the nervous system which so frequently develop after accidents or injuries that it will be necessary to relate some of the successive views which have been held concerning them. By reason of the conflicting opinions which still exist regarding the nature of these affections, and because of the constantly increasing litigation with which they are associated, they have come to take a very important place in medical jurisprudence.

Erichsen was the first to devote a special chapter to the nervous manifestations resulting from the shock and injuries incident to railway accidents. His classification of the symptoms was imperfect, and at that time the knowledge of nervous diseases was too little advanced to permit the identification of the functional disorders whose various types are now individualized. Erichsen believed the symptoms to be due to a concussion of the spinal cord, by which its molecular elements became disordered and diseased.

In 1883 appeared the second book on this subject, written by H. W. Page, surgeon to the London and Northwestern Railway Co. Page maintained with energy that most of the strange nervous symptoms so commonly seen after railway accidents were not due to physical injuries sustained by the spinal cord, but were the more or less immediate concomitants of the profound mental emotions aroused by the special incidents and features of every collision.

In the same year Putnam and Walton called attention to the possible hysteric character of the hemi-anesthesia sometimes observed in these accident cases.

The development of hysteria from these causes was described in detail by Charcot in 1887, although the possible traumatic origin of hysteria had been pointed out by Brodie years before. In 1888 Strümpell wrote that the clinical picture which frequently follows general commotion of the nervous system is best named "general traumatic neurosis." It bears marked resemblance to neurasthenia and hysteria, and sometimes certain psychoses. It is possible that material concussion acts together with the psychic influences. Strümpell also described certain local affections following accidents which are now known to be hysteric in nature.

Interest in this subject reached its height upon the appearance of

Oppenheim's monograph. Although admitting the existence of traumatic hysteria and traumatic neurasthenia, he asserted that there were frequently cases following railway accidents of which the nervous manifestations could not be classified with those of either one of these diseases. These cases presented the symptoms of hysteria and neurasthenia, and for them he employed the term "traumatic neuroses."

The views of Oppenheim and Strümpell created much discussion among neurologists; by some the existence of a special traumatic neurosis with characteristic symptoms was unreservedly accepted; many endorsed the theory with certain modifications; a few spoke emphatically against the occurrence of the symptom-complex as described by Oppenheim.

After this the opposition to the admission into medicine of a traumatic neurosis as a distinct disorder became more and more general. At the Twelfth International Medical Congress held at Wiesbaden, 1893, it was generally accepted that even after slight injuries general functional disorders not infrequently develop. These neuroses are not disease pictures of any special variety, but may all be classified under the name of other well-recognized neuroses, of which the most important are hysteria, neurasthenia, hypochondriasis, and their mixtures. The literature which has accumulated relative to this subject is now very large.

In 1919 Van Schelven published in "Trauma und Nervensystem," which was compiled from his experience in the Dutch service during the war, an interesting summary of theories and literature, in which he gives considerable space to a comparison between Babinski and Oppenheim. Babinski, writing in 1915, exponent of the school of Charcot, has the French authorities of the time to support him.

"Babinski and Oppenheim describe the same manifestations, as no one can doubt who during the war saw some thousands of shell-shock cases. Oppenheim does not find that these disturbances coincide etiologically with traumatic neurosis, if they are also apart from hysteria and neurasthenia, while Babinski's contention is that this group may be not only separated fundamentally from organic disturbance but also from hysteria.

"Oppenheim assumes the existence of physical changes in the nervous system in traumatic neurosis. Babinski, on the other hand, differentiates between the hysteric variations and those disturbances which differ from them through a physiologic manifestation which is still a matter of dispute as to its origin, being comparable to reflex atrophy after joint lesion.

"The vasomotor, secretory, thermic, and trophic disturbances make it probable that the sympathetic nervous system takes part through a reflex palsy of the nervous system."

The present generally accepted views regarding the subject are that abnormal emotional states may develop after physical injury or psychic shock, and when presented in this way may have many modifications of symptoms, but that there is no individual neurosis



resulting from accidents. All are now regarded as mixed or transition forms, and not as belonging to any one clinical entity.

Unsatisfactory as is the term "traumatic neuroses," it has gained a wide acceptance and cannot now be dispensed with, though "nervousness following injury" would serve as well, and would have the advantage of not tacitly committing the diagnostician to the belief that the condition be always of precise outline like tabes or general paresis.

There is at present a crying need for better definition of terms used in psychopathology. Neurasthenia has been used for a generation to cover almost all abnormal emotional states of a depressive character, and hysteria too often smacks of malingering in the minds of both doctors and laymen.

In the following pages "traumatic neuroses" will include: (1) traumatic neurasthenia, which will be considered to include all abnormal generalized emotional states following injury; (2) traumatic hysteria, which will include those patients in whom abnormal emotional states have become subjectively modified by the development through suggestion of some functional physical deterioration of a localized character.

For a considerable part of the last eight years much harm resulted from the common acceptance of the word "shell-shock" to cover all cases of nervous instability resulting in the course of war. Under the heading were massed cases of amnesia, anergic stupor, sleeplessness, nightmare, mutism, functional blindness, tremors, palsies, and further anxiety states, occurring not only under fighting strain, but also in individuals who, failing in self-confidence, suffered doubts and apprehensions while still awaiting transport overseas.

Much can be learned of nervous instability in general from that occurring in soldiers in war time, and an important fact on which first to fasten is that almost never were generalized psychoneuroses seen in soldiers suffering also from physical wounds of any consequence or degree. After shock or strain the amount of emotional destabilization varied inversely as the amount of gross physical injury.

On the other hand, minor injuries sustained in a dangerous milieu at a time when the man is under great emotional and physical tension often become psychically elaborated without the presence of any conscious desire to malingering. Almost all injuries of the extremities, in the writers' experience, are accompanied for a short period by at least a natural "defense immobilization" of the limb, quite apart from any organic nerve injury. This is a natural reaction from pain in tired persons. A flesh wound of the upper arm, for instance, easily produces in such men the impression of inability to move the wrist and hand.

Any doubt expressed by the physician—or even by a lawyer (sic)—as to whether or not, for example, an injury to the brachial plexus or nerve cords might not possibly account for the condition of the hand, sow the seeds of a fixed idea, which later may assume a very sturdy growth. To the weaker kind of men a minor wound offers an opportunity of temporary alleviation of their lot in war, and among the same class it may develop an idea of grievance against the civilian employer

or the rich corporation which should have transported him about his business in safety, added to which are the early shadowy ideas of financial opportunities thus opened to his vision.

In the soldier and civilian of the feebler fabric of humanity there is thus produced an emotional condition in which suggestions tending to augment the gravity of the injury in question are readily acceptable, and not willingly submitted to the critical judgment or to experiment which might possibly establish their trivial character.

It is not out of place, therefore, to point out here the importance of having these patients seen as quickly as possible by someone with *accurate technical knowledge*.

The power to make a careful physical examination, to weigh evidence with precision, and thereby attain correct diagnosis is the power that will give the physician enough self-confidence to be able to communicate healing to his patient. Time and again has one seen a half doubt in diagnosis prevent the coming together of physician and patient. If the physician be not entirely certain of the nature of the condition under review, his ability to cure it will be inhibited by the suspicion of the existence of an organic nerve lesion, on the one hand, or of conscious malingering on the other.

In short, functional motor and sensory palsies, and functional perversions of the special senses, are created by "localized suggestion" directed toward an affected faculty or member, and are susceptible of cure by like means and only by like means. To differentiate them rapidly and easily from similarly appearing organic conditions is the first and most important step in their treatment, and one which having been taken with firmness and accuracy will confer on the physician the authority and self-confidence to exorcise the system of false ideas that has been the immediate cause of the condition. I say "immediate cause," for in these cases due to localized suggestion there is undoubted evidence of the presence and effect of the same mental conflict, the strain of which produces in other men states of anxiety or other psychoneurosis, still more incapacitating for civil or military duty.

We are indebted to Freud and his school for our realization that neurotic symptoms may be produced by the antagonism of mutually incompatible emotional trends. The great mass of material lately made available by war demonstrates the general rightness of this principle, but still more definitely proves the peculiar wrongness of the detail with which the psycho-analysts have applied it, and entirely invalidates their deduction—elaborated as a pontifical dogma—that the sexual instinct, in albeit various disguises, is the only dynamic force possibly concerned.

The emotions associated with acquisitiveness and with gregariousness or group loyalty are powerfully operative after civil injury, and make it obligatory on all having to do with such patients to see to it, first, that accurate diagnosis be established by expert physicians and, second, that *final* adjustment of all claims for compensation be quickly made. The writers—as physicians—strongly deprecate the system of giving weekly stipends to persons suffering from nervousness following

injury. Compensation should be awarded as soon as diagnosis has been established; it should be in bulk, as a single sum, and if possible the case should be finally closed to allow "litigation neurosis" to subside.

**Etiology of General Traumatic Neuroses or Neurasthenia and Hysteria.**—The etiology of these conditions is in many respects so similar that it is more convenient to describe together the causative factors of each, mentioning later such individual differences as may exist.

**Kind of Accident.**—Both traumatic neurasthenia and traumatic hysteria occur most frequently as the results of accidents in which the body received a severe concussion or strain and the mind is dazed by emotion or fright. Railway and automobile accidents are particularly well adapted to furnish both these factors. By the sudden stopping or overturning of a railway carriage or motor car passengers and employees are thrown violently backward or forward, and the body may be severely shaken up, twisted, or crushed, or severe blows may be received on the limbs, head, or back. Consciousness is sometimes temporarily lost, but is usually retained, and the individual can thus appreciate the horrors and dangers of the situation.

In accidents of this character it is obviously possible that any part of the body may receive physical injuries of all degrees of severity. Functional nervous disorders may complicate such injuries, although it is a generally recognized fact that the more severe the physical injury, the less probable is it to be complicated by functional affections. In pure traumatic neurasthenia or hysteria no evidence of injury to the central nervous system is present, and such physical injuries as may be received are not regarded as being of a character alone sufficient to cause these neuroses.

Although railway accidents furnish the most conspicuous causes of the traumatic neuroses, these disorders may be produced in any one of a variety of ways. They may be the consequences of any catastrophe which results in physical commotion and psychic shock. Thus they frequently follow mishaps in elevators, in machine-shops, or motor cars. They may also, and hysteria especially, arise when the physical concussion is very slight or wanting altogether. They have followed a fall on the sidewalk, or the mere witnessing of, without participation in, some catastrophe. They may occasionally develop when no thoughts of litigation are entertained. Thus they have followed injuries received on the football field. Similarly, a previously strong policeman developed very severe neurasthenia as a result of stopping three runaway horses at the time of a parade. The man was not thrown down, and could bring no suit for damages, yet he was incapacitated for work for several years. On the other hand, prolonged neuroses have been quite rare as the aftermath of terrific natural catastrophe, such as earthquake, where the perpetuation of pecuniary aid was out of the question.

The rapid development in our generation of the industrial uses of electricity has added another to the already long list of exciting causes. Electric currents of high potential are now of such indispensable service



in city life that the danger of receiving shocks from street currents is one to which every citizen is more or less exposed. Rarely do electric currents which do not cause almost instant death cause organic nervous disease.

One of us (Kennedy) has seen a case of transverse spinal cord softening produced by a workman touching with his back a live wire; this man slowly improved, but had a pronounced spastic gait with reflex changes appropriate to organic spinal disease five years after the accident.

As far as the nervous system is concerned, it is usually the functional affections which result from accidents by electricity, and it is the general public rather than the employee which suffers. In persons unfamiliar with electric appliances powerful electric shocks are attended, independent of the shock itself, by a fright as severe as the fright of a railway accident. Fright must be regarded as the essential element in the causation of most of the nervous symptoms manifested by those who survive electric accidents.

**Predisposition.**—Among the factors active in the production of general nervous diseases predisposition, either hereditary or acquired through excesses of all kinds, occupies an important place. In ordinary neurasthenia inquiry usually discloses that the nervous system had never been altogether normal, or that it had become more susceptible to disease influences through the weakening effects of strain.

Undoubtedly, as has been said before, the weakling is more prone to develop neuroses after injury than is the man of strength and character, but one must remember that limited nervous reserves are often found in finely constructed bodies. On the other hand, all men are suggestible, and, as with metals, have their modulus of elasticity and strain.

It may and often does occur as the result of profound fright, or, after a long period of conflict and strain, that there may come a situation carrying with it complexes of such emotional strength as to render almost helpless the will-power to endure. Such a case was that of an officer of my acquaintance who, having borne the racking experiences of the landing and trench fighting at Gallipoli, one day, jumping to what he took for solid ground, found himself—as he put it with a gesture of infinite disgust—squelching thigh-deep in decomposed Turkish dead. For weeks this experience recurred to his consciousness both by night and by day in dreaded interruptions to his normal train of thought, rendering him for that period incapable of duty, a prey to the paralyzing influences of both repulsion and fear.

We have sometimes used the term “generalized psychoneurosis” to include those patients whose inability to “carry on” is the result of their mental and emotional conflicts having been decided against their higher selves, whose morale has given way before the aggrandizement of their emotions of self-preservation; these are the tremblers, the amnesic, the disoriented, those with night and day dream deliria, the stuporous. The anxiety neuroses are a milder type of the same great category, and result from prolonged strain and mental conflict rather than from single external catastrophe.

Associated with the foregoing symptoms, or more often occurring independently, are various losses or perversions of localized function, usually classed as hysteric stigmata. These may persist after the patient has resumed normal emotional control. On the whole, however, mutism, deafness, functional monoplegia, paraplegia, and functional spasms of the limbs are the result of localized suggestion rather than of generalized overwhelming of all the mental and emotional qualities, producing automatism and the temporary replacement of volitional by instinctive life.

**Occupation and mode of life** exert a certain influence upon the appearance of these disorders. Railroad employees, with the exception of locomotive engineers, are less prone than passengers to neurasthenia after accidents. This is explained in part by the fact that the former have become to a certain extent accustomed to the ordinary mishaps of railway travel, and partly because, for various reasons, an employee can ill afford to bring suit against the company, so that after an accident, if not severely injured, an employee usually returns to work. Why engineers do not share in this comparative immunity is explained by the constant mental strain, and consequent predisposition to exhaustion, under which an engineer, by reason of his responsibility, labors.

**Race** also has an apparent bearing on the question. On the whole, mental defect makes unlikely the growth of a psychoneurosis. The draft figures, showing a high percentage of mental defectives in negroes, help to explain the lessened liability to traumatic neuroses in the African race, as compared to Caucasians. The same tendency was found in the Italian group. A low mental defect average and a high propensity to the neuroses was found among the Hebrews, Irish, and French.

**Age.**—It is during the most active decades of life that traumatic neurasthenia occurs. It is rare after fifty, and still more so before twenty. Hysteria is in general a disease which affects younger persons, and of the two disorders, hysteria develops more frequently in childhood or adolescence.

**Sex.**—Men develop neurasthenia more frequently than women in the proportion of 3 to 1. The ratio is less for hysteria, although then also men are the more frequent victims. The larger number and varieties of danger to which men are exposed is probably accountable for the male majority. The natural anxiety of the breadwinner after injury must also be remembered.

The condition of the person at the time of injury is a factor of considerable importance. Pre-existing chronic and degenerative diseases render the development of functional disorders more probable. Thus a patient of Peterson's, who had suffered for years from amyotrophic lateral sclerosis, developed a marked neurasthenic condition, with great nervousness and tremor, as the result of a very slight blow from a revolving fan. Physical disease naturally gives rise to a sense of inferiority, which may readily be increased by injury. Alcoholic individuals are particularly susceptible to psychic influences, and in this country at

least alcohol is a potent predisposing factor to the traumatic neuroses. Nor is there any real reason as yet to change this statement by reason of the passage of Acts of Prohibition.

The circumstances of the patient after injury exert most important influences. If, as in the case of railway employees, it is imperative that the individual resume his work at the earliest possible moment, he generally does so, although still suffering from the effects of the shaking-up and shock which he has received. This return to work implies an attention to necessary routine which prevents him from a continual observation of his own symptoms. On the other hand, the man who seeks redress nourishes whatever symptoms he may have, and consequently his physical condition becomes, during the delay and vexations which are the inevitable accompaniment of litigation, worse and worse. Although some of these patients do not get well, even when no litigation is thought of, the anxiety attendant upon trials adds a very serious obstacle to recovery.

### NEURASTHENIA

Neurasthenia is a condition which is characterized by an anxiety state and a diminished power of resistance on the part of the central nervous system to the influences of fatigue. Most of its symptoms are subjective rather than objective, a fact which renders the disorder difficult to classify. In the absence of a normal standard of comparison it is not easy to determine the value of subjective manifestations, and consequently the term "neurasthenia" may convey different meanings for different individuals.

It can hardly be called a disease by itself; it may be superimposed upon any organic disease which exhausts the economy, or it may exist as an apparently independent condition. Just how far the clinical symptoms can be exaggerated or assumed will be considered in the section on Simulation. Neurasthenia following accidents is in most respects identical with simple neurasthenia. The chief difference consists in the prominence of pain in the back in the traumatic variety.

**Pathology.**—Little is known about the pathology of neurasthenia. There have been no autopsies recorded where lesions were found adequate to account for the symptoms. In the postmortem examinations which have been made the nervous system has not been examined by methods sufficiently delicate to disclose the morbid changes as delicate as those in neurasthenia must be. Visible changes may occur in the ganglion-cells of animals as the result of fatigue. And since the clinical expressions of fatigue form the most prominent element in neurasthenia, it has been inferred that changes would some day be found in the ganglion-cells of persons dying during the course of neurasthenia, similar to those that Hodge found in exhausted birds.

These speculations have not been corroborated by fact, and purely psychical states produced by suggestion are now thought to be the main abnormal condition, though occasional hyperthyroidism and chronic adrenal exhaustion have seemed to follow severe shock. Such definite



endocrinologic abnormalities have not been common or permanent or of long standing even after the terrific incidents of war.

**Symptoms.**—The appearance of the symptoms of traumatic neurasthenia is rarely immediate. There is usually an interval between the occurrence of the accident and the complete development of the disease, a period in which insidious suggestions play their part. It is during this time that treatment by a physician skilled in the management of such disorders is of greatest service, for it is then that the patient's mind can be best turned from the contemplation of his own misfortune and that he can most easily be brought to see that his truest advantage lies in employing every effort for the recovery of health. It is mental supervision, together with the ordinary simpler methods of therapeutics, which can in many cases cause the beginning symptoms gradually to disappear, instead of becoming progressively worse.

The duration of the latent period varies within wide limits. It is usually a few days, although it may be several weeks. Immediately after the accident there may be a considerable shock, lasting for several hours or more. The patient is nervous, tremulous, dizzy, pale, and complains of pain if there has been any bruising or severe concussion. The skin is cold, often covered with sweat, and the pulse is rapid. Sleep is usually interfered with, although some patients are somnolent after accidents. There is no appetite and vomiting is frequent.

When severe blows have been received on the head, consciousness may be lost for a longer or a shorter time. Even in the absence of evidence of any such injuries consciousness may be impaired. It is not of infrequent occurrence for the patient to say that he did not become insensible, but that he cannot remember the details of the accident. The intensity of these early symptoms varies with the character and severity of the accident and with the character of the individual. As a rule the patient is able to go to his home alone or to some place of shelter, provided, of course, that he has not received injuries which prevent walking. Generally within a few days after the accident the development of the characteristic neurasthenia picture begins, of which the symptoms will be considered here in detail.

**Mental Symptoms.**—The most prominent mental symptoms of traumatic neurasthenia are irritability, anxiety, and depression. Slight noises or jars are sufficient to cause extreme annoyance and to prevent sleep. Sleep is usually disturbed and interrupted; frequently it is accompanied by nightmare. Anxiety is shown by the patient not only in regard to his own physical condition but also from the fact that matters of trifling moment become serious questions. Decisions, even about the most ordinary matters of every-day life, are arrived at with difficulty. Indecision may reach so exaggerated a degree that the patients are entirely unable to decide questions for themselves. This may be explained partly by a feeling of constant apprehension, not so much of anything in particular, as the feeling that "something is going to happen." The patient becomes afraid of going on the street on this account, and is inclined to shun society of all kinds. Morbid fears are

frequent. They are especially pronounced regarding anything connected with the accident. If it was a railway, railway travel, when possible, is avoided, and the patient is never comfortable when in the cars; if on an elevator, the patient will prefer to walk upstairs.

Intimately connected with this anxiety there is depression, which finds its expression in complaints and remarks of gloomy character. The patient's whole interest centers about his own condition, and it is difficult to distract his attention to other things. He becomes, consequently, more indifferent and less altruistic. The effects of fatigue are quickly observed after any mental effort. Reading, writing, and talking quickly tire, and the mind becomes easily confused. Although mental processes are thus impaired, there is no true loss in intellectual caliber.

The facial expression of a neurasthenic is characteristic, although difficult to describe. It indicates not so much bad health, as discouragement, anxiety, and fatigue; in it can be read the eternal speculations and self-questionings going on in the mind. The face may be pale, although very often if the cheeks were red before, they do not lose their color. The mental symptoms form the most important manifestations of neurasthenia, and upon them depend in large part the others. They are chiefly subjective, and consequently difficult of evaluation. In general, they are very real to the patient, causing him intense mental suffering. The constant introspection and unwarranted anxiety over unimportant symptoms may amount to a condition of hypochondriasis.

**Motor Symptoms.**—In simple traumatic neurasthenia there is no paralysis, for there are no gross lesions in the brain or spinal cord, and the paralyzes of functional character are limited to hysteric conditions. But although there is no one muscle which loses completely its powers, or presents changed electric reactions, all the muscles become weakened to a certain degree. The patient feels that he has less strength than formerly, and that he becomes more easily tired than he used to do. All muscular work is irksome, and walking is particularly fatiguing. In the gait there are no abnormalities due to the loss of muscular power—the patient walks slowly but steadily, without uncertainty or ataxia. The normal character of the gait may be interfered with through an unwillingness of the patient to use certain muscles on account of the pain in them, or through stiffness of the spine caused by pain. But the muscles of locomotion themselves are in no way incapable of performing their tasks, although they may quickly become fatigued. Tremor is constant, and has much the same character as the tremors observed in alcoholics and persons who drink tea to excess. It is fine and rapid, and while it becomes more pronounced on intended movements, it is chiefly intensified by emotional influences and fatigue. At times it disappears altogether. It most usually occurs in the muscles of the face, the tongue, and the hands. The tremor of the eyelids, which is commonly spoken of as a symptom, is perhaps too common an occurrence in normal individuals to be a valuable diagnostic sign.

**Sensory Symptoms.**—One of the most prominent symptoms of traumatic neurasthenia, and especially when the condition has been induced

by the combined influences of injury and shock, is pain. It is an element which increases the gravity of the prognosis, since by its presence the patient's attention is constantly fixed on his own condition and the causes of it, and he acquires the habit of avoiding as far as possible all movements by which the pain may be increased. The pain has many different situations and characters. It may be referred to any part of the body which was bruised or injured at the time of the accident and often persists for a very much longer time than the nature of the injury itself would lead one to expect. Not infrequently it is complained of as a general feeling of soreness in all the muscles. This may be sufficiently severe to interfere with sleep. In the head it occurs as a dull aching pain, either frontal, similar to that of constipation, or occipital. The latter situation, which is the more frequent, the patient may dramatically describe as "the base of the brain." Pain in this region causes him much anxiety. The situation, *par excellence*, of the pain of traumatic neurasthenia is in the back. It exists most commonly as a general soreness and weakness in the back, with areas of hypersensitiveness over certain of the vertebræ, most commonly in the cervical and thoracic regions. The patient complains of aching in these localities, and any attempt on the part of the physician to examine them by pressing upon them or tapping them is attended by active demonstrations of suffering on the part of the patient. Nevertheless, although the patient is rendered unquestionably very miserable by this symptom, it is not probable that the pain is due to any localized injury to the bones or the joints of the spine.

For if these parts be touched when the patient's attention is distracted he may be made to endure considerable pressure over the tender spots without flinching. Also the pain has too shifting a character to be dependent upon localized disease. Successive testings usually show that the same spinous process rarely continues to be the seat of the most acute tenderness. At one examination it may be in the lower cervical region, at another in the mid-thoracic. This purely neurasthenic form of pain in the back is especially common in women.

Naturally, violence applied to the spine may give rise to ligamentous pain or even laceration. The localized nature of the pain and its improvement under rest and with support help to distinguish such injuries from functional states; again, however, an accurate appraisal of the patient's personality as well as of his back is necessary before coming to a diagnosis. Subluxation of the sacroiliac joint may occur through injury, and may be known by its local tenderness and sciatic pain, and may be located by radiograph; usually the patient is unable while lying on his back to put the ankle of the affected side upon the opposite knee.

Paresthesia is another common sensory symptom of traumatic neurasthenia. It appears in the form of numbness, tingling, the feeling as though something were crawling, and other peculiar sensations in different parts of the body. Anesthesia is no longer admitted as a symptom of neurasthenia, but can often be induced by suggestion from the examiner. Certainly in the past more importance has been attached to



slight impairment of cutaneous sensibility than the symptoms deserved. And now cases which combine pronounced anesthesia with neurasthenic symptoms are regarded as having some other condition than neurasthenia as their basis. The question of anesthesia will be more fully considered in the section on Hysteria.

**Special Senses.**—Impairment of vision is the most important of any of the symptoms of traumatic neurasthenia which affect the special senses. The patient rarely complains of any ocular disturbance more definite than flashes of light before his eyes, or that his eyes become easily fatigued. The perimeter may disclose, however, objective evidences of impaired vision when the other methods of examination give negative results, apart from any possible pre-existing organic defects. The pupils are equal in size and react usually quickly to light and during accommodation. The fundus of the eye is normal, and the ocular muscles are not paralyzed, although occasionally muscular insufficiencies are observed. Upon marking out the visual fields with the perimeter, however, it may be found that there is a diminution of seeing power in the periphery of the field, although the acuity of central vision remains unimpaired. This is revealed by the quickness with which the retina becomes fatigued; it is known as "the shifting type of contraction" (Förster). By this test it appears that the retina loses some of its peripheral power by successive tests of its function, that the visual field is smaller the second time an object passes across it than it was the first, and smaller the third time than it was the second.

In this, as in other methods for determining the visual field, repeated examinations at different times should be made. The object is moved along the horizontal meridian of the perimeter from without inward to the center and then continued across to the nasal limit, and then moved back again to the temporal periphery. In appropriate cases the testing object will, on its return outward, be lost to view before it has reached the limit of the original field; a similar contraction is observed on the nasal side when the object is again moved inward. It is less reasonable to suppose that this shifting contraction of the visual field is due to actual fatigue of the retina than to ascribe it to the instability of the attention.

Of the other special senses, taste and smell are not affected. Hearing remains unimpaired, although there is very frequently buzzing in the ears and hyperacuity of hearing, which causes the patient much annoyance. Another symptom, which may be referred to the ear, is dizziness. It is a nearly constant part of the neurasthenic picture, but it is also subjective rather than objective. The patient complains that he is in constant fear of falling, and that he is frequently obliged to sit down or to catch hold of surrounding objects in order to steady himself. Yet when told to walk or to stand with the eyes closed, the unsteadiness and swaying are either slight or else are very much exaggerated.

**Reflexes.**—The superficial and deep reflexes in traumatic neurasthenia are either normal or exaggerated; they are never diminished.

Exaggeration is the condition commonly encountered, especially in the deep reflexes. A slight tap on the patella tendon is sufficient to excite a forcible extension of the leg, and the wrist, elbow, and biceps jerks, which are often absent in health, can be elicited with ease in neurasthenia. Ankle-clonus is not present. The superficial reflexes are present, but from the lack of any standard as to their normal reaction to stimulation it is difficult to say in any given case whether they are exaggerated or not.

The value of a bilateral increase in tendon reflex has been much disputed. It is found in so large a number of cases of organic and functional nervous disease, as well as in so many persons who apparently are not ill, that it cannot be regarded as pathognomonic of any one condition, especially not that of traumatic neurasthenia. The most that can be said of this phenomenon is that when combined with other symptoms it constitutes valuable contributory evidence.

**Vascular Disturbance.**—As in most of the neuroses, the heart in traumatic neurasthenia is irritable. In very few cases does the pulse-rate remain normal at the time of examination, and it is not unusual for it to become as rapid as 120 or 130 or more a minute. It is increased by emotional disturbances of any kind, by stimulants, and, not the least important factor, by the presence of the examining physician. That the heart action may be intermittent and irregular, so that even when the patient is at rest and undisturbed the heart beats more rapidly than usual, is possible; and it must always be remembered that the neurotic has a lowered threshold of psychologic and emotional stimulation, and that some few cases develop true hyperthyroidism after shock.

Associated with cardiac irritability are the ordinary subjective sensations of palpitation of the heart, such as precordial anxiety and oppression, and the sensation of throbbing in various parts of the body. The hands and feet may be cold, and there is frequently an alternation of heat and cold sensations over the whole cutaneous surface. Sweating is also a frequent symptom.

The remaining symptoms of traumatic neurasthenia are generally present, but are of secondary importance. They are referable to the digestive and sexual organs. Constipation is common, and is generally associated with evidences of gastric irritability. In ordinary cases the appetite remains good. The patient frequently complains of involuntary emissions and diminished sexual power. These symptoms are rarely important. In women the menstrual functions may be disordered, the urine does not show any characteristic morbid changes.

**Prognosis.**—It was at one time believed by physicians, and is still the very general opinion of laymen, that traumatic neurasthenia or hysteria begins to improve as soon as litigation is at an end, and that of all remedies, financial compensation is the most speedy and the most certain in its action. Larger experience has shown that this view is not entirely correct. It is true that in the traumatic neuroses, as in diseases of any character, annoying and exciting agents exercise an unfavorable influence, and that improvement in symptoms ordinarily follows

when such circumstances cease to exist. Nevertheless, there are many rebellious cases of accident neurasthenia in which there is no question of damages, but in which there may be inherent weakness or faulty suggestions other than those contained in litigation, and in a few of those which do become the subject of litigation the patients improve but little or not at all even when the suits are decided in their favor.

The hopes for recovery of health are very much better if there be no question of litigation and if the proper moral influences can be brought to bear upon the patient immediately after the accident. In a patient who from the beginning can be under the care of a competent physician and who can be shielded from all that excites or fatigues, the prognosis for recovery should be very good, although it may be some time before complete health is re-established. All degrees of improvement are possible; the patient may be able to resume work, although he still regards himself as a sick man, or he may remain a useless neurasthenic for years, a burden to himself and to his friends, and eventually die of some degenerative disease.

Preceding organic disease, especially degenerative conditions of the heart, kidneys, and blood-vessels, renders prognosis more grave; it is in such cases only that traumatic neurasthenia, by adding renewed activity to pre-existing morbid processes, may prove to be a direct menace to life.

#### TRAUMATIC HYSTERIA

The nosologic position which hysteria now occupies in clinical medicine was first established by Charcot's untiring zeal and wonderful powers of discrimination. By his researches in the Salpêtrière at Paris hysteria was shown not to be the mixture of affectation and deception that it had formerly been regarded, but a clinical entity capable of identification by definite signs. It was shown to be a disorder which may be exaggerated, but which itself is not a consciously simulated condition. The paralysis, anesthetics, and convulsions of hysteria are as real to the patient as if they depended on gross physical lesions. They are often difficult of successful simulation. The apparent simulation of other diseases seen in hysteria is not voluntary simulation, but is one of the results of the extreme suggestibility of the hysteric mind. The false statements of hysteric patients are not necessarily wilful lies, but may honestly originate from hallucinations or from the desire of attracting attention, which is so pronounced a symptom of the disease.

**Etiology.**—For the development of hysteria a deteriorated nervous system, if not absolutely essential, is at least a very important factor. Charcot thought that the condition appears only when an exciting cause (agent provocateur) acts upon the nervous system predisposed by ancestral defects or by acquired enfeeblement. It is, however, often difficult to prove the existence in ancestors of disease or degeneration of the nervous system. In America especially, where so many of the poorer classes have immigrated as children and know little or nothing about the ancestral branches of their family, it is frequently impossible



to obtain any reliable information regarding antecedents. Dana and Knapp both regard hereditary factors as of less importance in hysteria when it follows accidents than when it owns some other provoking agent. Diminished powers of resistance on the part of the nervous system are generally observed in the chronic diseases (nephritis and diabetes) and in chronic intoxications (lead, alcohol, and mercury). They form a fertile soil for the development of hysteric manifestations, and such evidence of acquired predisposition may be discovered when search for hereditary factors is fruitless.

Far more prominent, however, among the exciting causes of hysteria are trauma and shock; and when the condition develops as a result of these agents, it is commonly called hysteria traumatism, or traumatic hysteria. From the not infrequent association of neurasthenic symptoms it is sometimes known as traumatic hysteroneurasthenia.

Hysteria is more frequent in women than in men, though this is hardly true of the type induced by injury, and the symptoms are somewhat different in the two sexes. It was by the study of hysteric stigmata as they occur in men as the results of accidents that the existence of hysteria in the male became established. Further studies showed that men could have hysteria independently of accident, but that the symptoms were then nearly the same as traumatic hysteria. Babinsky has lately advocated the use of the word pithiatism instead of hysteria, in that he believes—and the belief is growing more and more widely—that these hysteric conditions especially when following injury are always the result of suggestion on an emotional and strained personality.

Hysteria is everywhere a much less common sequel of railway accidents than neurasthenia, and, on the whole, is not so frequently observed in America as in Continental Europe. It seems to be more common in men after injury than in women; such is Dana's experience; and Berbez, in 21 cases, found 14, or two-thirds, men. Knapp, on the other hand, found 13 women out of 25 cases. When accident is the exciting cause of hysteria in women the symptoms are usually modified by neurasthenic conditions, and resemble those of hysteria in the male very closely.

**Pathology.**—It would be useless to enter here into theoretic speculation upon the physical pathology of hysteria. Absolutely nothing is known as to what morbid anatomic changes are responsible for the symptoms of this disease.

**Symptoms.**—The symptoms of hysteria may be inadequately divided into two groups—continuous and paroxysmal. The continuous symptoms are called stigmata, and consist of the mental state, of anesthesias, affections of the special senses, etc.; the paroxysmal symptoms, as the name implies, are inconstant in their occurrence, and embrace the convulsions, contractures, and paralyses. They may disappear as suddenly as they came, without leaving any trace of their passage.

**Mental State.**—The chief characteristic of the hysteric mental state is suggestibility. The patient is constantly subject to influences similar to those used in hypnotism. According to Charcot, hypnotism is simply the effect of suggestion upon the hysteric mind, and the mental symp-

toms of hysteria and the manifestations of provoked hypnosis, if not identical, are closely allied. Charcot taught that in traumatic hysteria the patient became suddenly hypnotized through the agency of the injury or shock; and that the resulting clinical manifestations were the result of suggestion similar to those seen in ordinary hypnosis (traumatic suggestion). This is certainly the best explanation of the genesis of the disorder; by it can be explained such symptoms as are purely psychic manifestations. Thus, an actor, forty-seven years old, fell from the flies of the theater, striking on his back. He became, a few days later, completely aphonic, a condition which lasted several months. He then fell from the rear platform of a rapidly moving train. He received no discoverable physical injuries, but was very much astonished to find that he could talk as well as ever, and has had no difficulty in speaking since.

In a person once hypnotized the most trivial occurrences may act as a hypnotizing agent, and it sometimes seems as though these agents originated in the patient's own brain (autohypnosis). However, in hysteria following accidents the exaggerated mental symptoms seen when the disorder is provoked by other agents are infrequent. The purity of hysteric character of the manifestations is impaired by the superimposed neurasthenic symptoms. Indeed, the initial symptoms of accident hysteria are nearly always neurasthenic in character. This was well illustrated by Charcot in the following history:

"Man, fifty-three years of age, industrious laborer, witnesses the suicide of his son. He loses consciousness for several instants. From that moment the father is a changed man. From being gay and active, he becomes sad and bad tempered. He shuns the people with whom he used to be on good terms. His sleep becomes restless through painful dreams. He thinks of his son as a happy child, and then sees him pale, bloody, and disfigured. The memory for recent events fails, the man becomes distracted. His head feels as though he wore a heavy cap, and he has noises in his ears. The sexual functions are weakened; there are digestive disturbances after eating. He becomes weak and easily fatigued."

These symptoms are evidently of neurasthenic character. They continue as typical of the mental disorder in traumatic hysteria. To them may be added the nightmares which give rise to hallucinations believed in during waking hours, the credulity, the exaggeration of simple hysteria. But the exaggerated psychic manifestations of trance, catalepsy, alterations of personality, and the like are only occasionally observed in hysteria provoked by accidents.

The memory may be seriously impaired. There is oftentimes forgetfulness of the accident, and subsequently there may be periods of almost total amnesia. But complete losses of memory are inconstant, and what is forgotten today may be remembered tomorrow.

The will often becomes also very much enfeebled, resembling the forms of abulia seen in neurasthenia and doubting insanity. Page remarks, quoting from Sir James Paget, "the patient says, as all such

patients do, 'I cannot.' It looks like 'I will not,' but really is 'I cannot will.'” With such alterations of physiologic processes it will be readily understood that the hysteric patient may lose in mental power and undergo changes of character.

It is in the mental state that the explanation of most of the physical manifestations of hysteria is to be sought. This is especially true for the anomalies observed in the special senses.

It is essential thoroughly to understand that, according to our modern conceptions of hysteria, the derangement of sensory function does not imply any derangement of the sense organs themselves. It has been abundantly proved by hypnotism and other means that a patient with hysteric amaurosis sees; that sensations from anesthetic areas are received if not perceived, and that voluntary movement is possible in paralyzed limbs—*i. e.*, the optic, sensory, and motor organs, tracts, and centers are anatomically intact. The defect is to be sought for in the association centers of the mind. When hysterically anesthetic skin is touched the sensation passes along normal paths to the sensory stations in the brain. But the power of association of sense perception is wanting, and so the arrival of sensation is unnoticed by the higher ego, although it is, in reality, unconsciously recognized. Thus the hypnotized patient may be able to describe sensations of which, in the conscious state, he is unaware. Most of the various hysteric phenomena may be explained on the theory of subconsciousness or unconscious consciousness. For us it is sufficient to know that the symptoms of hysteria are real to the patient and largely beyond his control. A recognition of this fact is essential for the appreciation of hysteria in either its clinical or legal relations, for it explains the changeability of the symptoms and removes the victim of the disease from the category of impostors.

**Sensory Stigmata.**—*Anesthesia.*—By far the most frequent continuous sign of hysteria is cutaneous anesthesia. It is most commonly total in that all forms of sensibility are equally impaired or abolished, or that there may be a dissociation of the different varieties of sensibility, so that some forms of stimuli are perceived while others are not. Sensibility may be completely lost, so that there is no perception whatsoever of peripheral irritation, or it may merely be impaired, so that deep pressure may be felt when light touches are not noticed, or that strong electric currents may cause pain in cases in which pin-pricks are not followed by any discomfort. The cutaneous surface is the most frequent seat of anesthesia. To the eye and to the touch hysterically anesthetic skin is normal; while in the anesthetic areas the sense of position is usually retained. In examining for anesthesia the eyes of the patient should be covered.

Hemi-anesthesia is the most frequent distribution topographically of the loss of cutaneous sensibility. Less frequently there are scattered over the whole body anesthetic areas of various dimensions. In a variety commonly met with the anesthesia involves geometric areas. A frequent example of the geometric distribution of anesthesia is the loss



of sensibility in the arms or legs in regions corresponding to the areas covered by gloves or stockings. The "glove" or "stocking" anesthesia is particularly common where there is an hysterical paralysis as well. Thus a patient (Fig. 170) has a hysterical monoplegia of the left leg, and is totally anesthetic in that leg below the knee. General hypesthesia is often seen, and then is usually associated with other pronounced hysterical stigmata. It is an important diagnostic aid that anesthesia does not follow either the distribution of peripheral nerves or of spinal segments.

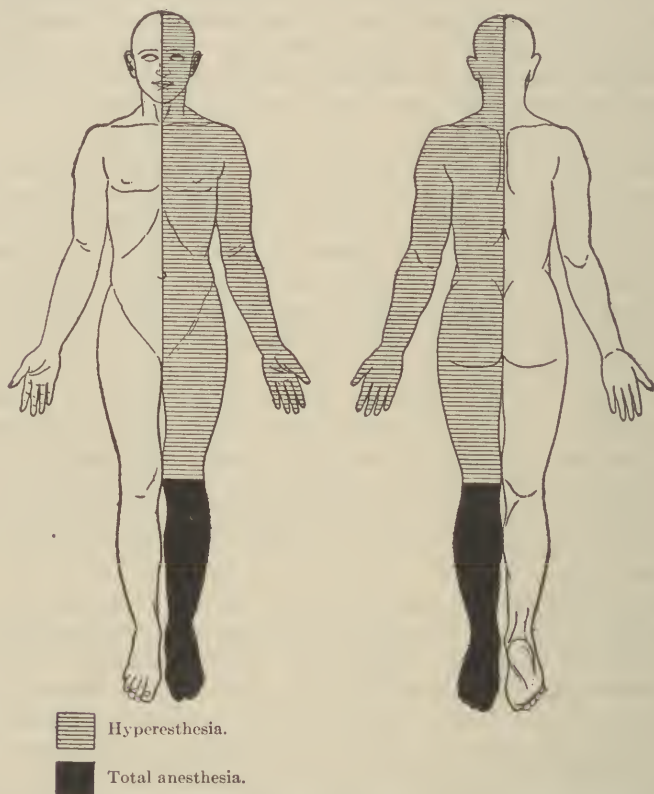


FIG. 170.—Left hyperesthesia with total geometric anesthesia in leg (traumatic hysteria; personal observation).

Anesthetic areas often follow vulgar notions of sensory nerve supply, *i. e.*, a minor injury to the hand may result in a motor palsy of the hand, and a sensory palsy also of the hand, sharply limited by the curve of the wrist-joint.

These anesthetics may be permanent or transitory. In general, the smaller the area of sensory involvement, the more lasting the impairment of sensibility. It may entirely disappear, or its situations may suddenly change; such returns to normal sensibility and such transferences may be accounted for by suggestion, either unrecognized or intended, as

when a hemi-anesthesia is made to go from one side of the body to the other by the influence of a magnet or faradic brush.

The psychic character of the left hemi-anesthesia was well demonstrated in one of our patients who, during the doctor's rounds, was sitting in bed with her arms crossed. When the arms were pricked with her eyes closed she felt nothing in the right arm which was lying in the left anesthetic field, and, till she discovered her mistake, felt accurately in the previously anesthetic left arm, which lay in the field of normal sensation.

Janet ascribes these palsies of special sense to diminished powers of attention in the patient, who as a concentrative measure cuts out of his sphere of consciousness a stream of incoming sensations, just as a man may fail to "hear" the roar of traffic when he is reading a novel. If the circumstances of the onset and development of hysteric symptoms be analyzed, one will usually find some factor of concrete local determining character. It is proper, however, to point out that while we can understand a man who has struck his friend following subconsciously the command of the Bible to "cut off his right hand," we cannot as yet determine the exact elements in that man which make it necessary for him to adopt this self-denying ordinance, in a contrast to those who do not have the same disability. Hysteria is, however, always a refuge from a reality unacceptable to the patient's idea of himself, whence it follows that hysteria rarely or never occurs in him who faces issues squarely, nor ever seeks to evade consequences by self-deception. Hysteric blindness is prefaced by blindness to facts and ideas, and is an inadequate solution of an unpleasant problem by a weak personality.

An allied hysteric sensory disturbance to anesthesia, of which, by the way, the patient rarely complains, is hyperesthesia. It is unusual for hysteric hyperesthesia to involve such extensive surfaces as anesthesia may occupy, and it is almost unheard of for it to be generalized over the whole body. It most frequently occurs in small and limited areas, the distribution of which follows a certain regularity. Frequent sites are the back, along the spinous processes of the vertebræ, the top of the head, the ribs, and in the female the ovarian regions. The hyperesthesia of the joints will be described under the hysteric disorders of motion. In hysteria following traumatism there is very frequently found long-persisting hyperesthesia of the injured part. The degree of hypersensitiveness varies, although usually it is so great that the slightest touch produces evidences of extreme pain. The seat is in the skin, as deep pressure ordinarily is not painful.

The hyperesthetic areas constitute, in paroxysmal hysteria, what are known as hysterogenetic zones. Pressure upon them may induce convulsions; or pressure exerted during a seizure will cause a cessation of the movements. The hyperesthetic areas, in addition to presenting increased sensibility to the touch, are frequently the seats of spontaneous pain. Thus there is the *clavus hystericus*, a sensation as though a nail were being driven into the head, the persisting pain in parts which have received local injuries, and the long-continued and exaggerated pain of

the hysteric joint affections. Hysteric pain does not materially interfere with sleep, nor has the patient the evidences of exhaustion which appear with pains of other origin.

Visual disturbances are the most frequent and important of hysteric disorders of the special senses. Apart from possible pre-existing organic disease or defects, the eyes are found to be anatomically normal. Examination of the pupils, the optic nerves, the ocular muscles, and the refracting apparatus is negative. The conjunctivæ are usually anesthetic, and there may be abolition of the conjunctivopalpebral reflex. Nevertheless vision is often impaired (amblyopia) or there may be total blindness (amaurosis).

The visual fields in hysteria may be normal, but they are usually more or less contracted. For practical purposes the dimensions of the visual fields may be estimated by comparison with the field of the

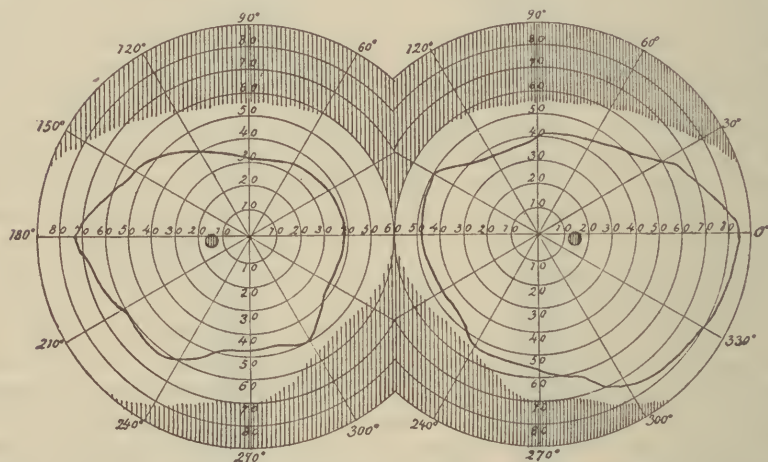


FIG. 171.—Contraction of the visual field in a case of traumatic hysteria. The paralysis and anesthesia were on the left side (personal observation).

operator; but in cases intended for future reference and in all cases that have medicolegal relations the field of vision should be accurately recorded by means of the perimeter. Most frequently the limitation is moderate and more pronounced for one eye, the more extensive limitations corresponding to the anesthetic side of the body; if there exists, as well, a unilateral cutaneous anesthesia (Fig. 171). The contraction of the visual field of one eye may be absolute or nearly so. Hysteric blindness of both eyes—bilateral amaurosis—has been observed, but it is among the more infrequent of hysteric phenomena and is of temporary duration. At different examinations the extent of vision may vary; but the variation does not follow the regular shifting type observed in neurasthenia. The acuity of vision, unless there be blindness, usually remains unimpaired. Limitation of the visual fields occurs in some few disorders other than hysteria. In such cases the diagnosis of hysteric



amblyopia depends on the presence of other hysteric symptoms and on the absence of the symptoms of the other diseases. König has pointed out that contraction of the visual field is essentially a hysteric stigma in the absence of organic disease.

Associated with hysteric limitation of vision for white are characteristic changes in the color fields. Physiologically, the color field is largest for blue and becomes successively smaller for yellow, orange, red, green, and violet in the order named. With marked contraction of the visual field for white, the perception of the most internal colors—violet and green—may be lost; or sometimes, without excessive alteration in the field for white, there may be a reversal of the normal color fields, so that red is seen in a larger field than blue.

Disturbances of vision, like those of general sensation, are usually discovered in the examining room; the patient only occasionally knows that they exist, and still less frequently complains of them. They form such necessary symptoms for the establishment of the diagnosis of hysteria that search for them should in no case be neglected.

Affections of the other special sense organs in hysteria are frequent, and follow the same general laws as do those of the eye. There may be deafness without lesions of the ear; loss of taste (ageusia), more or less complete, which may be associated with anesthesia of the throat and tongue; loss of smell (anosmia) without discoverable disease of the olfactory nerve. The disorders of these special senses are usually unilateral, and most frequently occur in the side of the body which is the seat of cutaneous anesthesia.

**Motor Symptoms.**—Paralysis, although less frequently observed than anesthesia, is a very important symptom of hysteria, and is especially frequent when the disorder is of traumatic origin. Hysteric paralysis may at once follow a shock or blow; thus, immediately after striking her child on the head, a woman became paralyzed in the arm. More frequently, however, there is some time between the action of the exciting cause and the paralytic symptoms. This interval, which is variable in length, was admirably called by Charcot "the period of meditation." The eventual appearance of the paralysis is usually sudden, and unless developed during a paroxysm, or in immediate sequence to an injury, is unattended by loss of consciousness.

Hysteric paralysis has certain characteristics which help to differentiate it from paralytic conditions depending on other causes. It is widely distributed among the muscles of the affected parts, thus forming a contrast to the cerebral palsies of organic origin, which affect certain groups of muscles (extensors) more than others. The degree of hysteric paralysis is variable; it may amount to nothing more than weakness, and is then generally distributed, forming one of the permanent stigmata; or it may be, in the parts affected by it, sufficiently pronounced to make any voluntary movement impossible.

In lesions of the pyramidal tracts, either in the brain or spinal cord, there is a tendency, as soon as the original shock has passed away, to a condition of spasticity, manifested by an increase in the activity of

the tendon reflexes, an extensor type of plantar reflex, and by contractures. In uncomplicated hysteria the reflexes are normal or exaggerated, and the occurrence of foot-clonus is most unusual, the plantar reflexes are normal or lost. Spasm of certain muscle groups, however, may occur, and they are often difficult of diagnosis. For a recognition of their true character it is usually necessary to look for other symptoms of hysteria, although hysteric contractures have certain characteristics of their own. They generally develop and disappear suddenly, are associated with anesthesia, and involve all the muscles of a group. They do not necessarily relax during sleep; the fact that they do relax during etherization is of little assistance in medicolegal cases. These resulting contractures are usually too rigid to permit successful examination of reflexes.

The paralyzes of hysteria are not accompanied with serious trophic changes, and the electric reactions remain normal. Hysteric atrophy has been described by the French, but it is probable that this is an atrophy of disuse rather than an interference with central trophic function. The most common distributions of hysteric paralysis are in the forms of hemiplegia, brachial monoplegia, and paraplegia. When unilateral, the paralysis affects the left side in the larger number of cases. In hysteric hemiplegia the face is rarely involved, although there may be spasm of the facial muscles, either of the sound or of the paralyzed side. Monoplegias of the arm are the most frequent forms of hysteric paralysis due to traumatism. They are usually associated with "mass" anesthesia, corresponding to the cutaneous areas covering the paralyzed muscles. The loss of power may involve the whole member or only certain muscle groups.

When hysteric paraplegia occurs as the result of shock or injury its onset is usually sudden. This form of paralysis is particularly subject to spasm of muscle groups which may cause permanent contractures. The functions of the bladder and rectum are unimpaired. Sometimes there is a tendency, through spasm of the bladder, to retention of urine.

Astasia abasia, a term invented by Blocq, is an hysteric affection of the legs in which, although retaining their power in other things, they are unable to support the body in standing or walking. There is usually no anesthesia.

The duration of the morbid muscular conditions which have been described varies within wide limits. The paralysis may be transitory or persist for years. In long-standing paralyzes and contractures there is a strong tendency to adhesions of the joints, so that they may become permanently immobile.

**Tremor** is an almost constant symptom of hysteria following accidents. It may imitate the fine tremor of paralysis agitans or the coarse intention tremor of multiple sclerosis. It is intensified by exciting influences and disappears during sleep. Its location may be generally distributed, or it may be confined to a single limb. Its more common form is a fine tremor of the hands and fingers. There is also a variety

of morbid movements which are commonly classed as of hysteric character, although in many the other hysteric stigmata are absent.

**The Hysteric Paroxysm.**—When hysteric convulsions occur under our observation they rarely if ever follow the four periods which have been described as so frequent in the Salpêtrière. These periods are: (1) Epileptiform; (2) period of grand movements; (3) period of passionate attitudes; (4) period of delirium. In America the hysteric equivalents of laughing or crying or of periods of great excitement are more frequently seen.

The convulsions of hysteria sometimes simulate very closely those of true epilepsy; but the term "hystero-epilepsy," which is often applied to them, is a misnomer, as the disease is either hysteria or epilepsy, or the two diseases occurring simultaneously in the same individual. Although in many cases the two diseases occur together, and although it is often impossible to distinguish them, it is better to state that such is the case than to employ a misleading and indefinite nomenclature.

In addition to the physical and mental condition of the patient there are the following differences between a fit of epilepsy and one of hysteria: in epilepsy the convulsion is of short duration, is not necessarily preceded by an aura, and occurs very frequently at night. The duration of a hysteric attack may be a half-hour or more. Premonitory symptoms are constant. The onset of an epileptic fit is absolutely sudden, without external cause, and accompanied by loss of consciousness. An hysteric attack has usually an environmental cause, works up to its climax, and is not associated with loss of consciousness. The corneal reflexes are lost in epilepsy and not in hysteria. Biting of the tongue and involuntary passage of urine, almost constant phenomena in epilepsy, do not occur in hysteria. During the seizure the pupil reacts to light in hysteria, not in epilepsy; and after the epileptic attack the plantar reflexes are of the extensor type, which is not the case in hysteria. Cyanosis occurs in epilepsy, not in hysteria.

The movements in epilepsy are spasmodic flexions and extensions of the rhythmic type; in hysteria they are purposive in character; fighting, biting, or crying out. Furthermore, the convulsive movements in hysteria have an exaggerated character; the period of tonic contraction is longer than in epilepsy; opisthotonos is common. At the expiration of the epileptic attack the patient commonly goes into the condition known as postepileptic stupor; from the hysteric attack the patient recovers immediately. After an hysteric attack new stigmata may occur or existing ones be made worse. Hysteric convulsions are infrequent in accident hysteria.

**Hysteric Joints.**—The joints are frequently affected in traumatic hysteria. The knee is the most often involved, the hips being next in order of frequency. The development of hysteric joint troubles is generally rapid. They may appear very soon after an injury, though usually there is a period of meditation here as in other hysteric manifestations. The skin over the affected part is extremely sensitive; and movement is attended with great pain. Local cutaneous anesthesia, with the ordinary



characteristics of hysteric anesthesia, exists around the joint. Swelling, although it may occur, is unusual. The muscles surrounding the joint quickly become contracted, and some atrophy may occur in them. The diagnosis depends upon the presence of other symptoms of hysteria and the lack of cause adequate to produce organic disease. The joint may remain useless for weeks or months; when of long duration the condition is liable to be seriously complicated by organic ankylosis. The hysteric joint affections may disappear suddenly; in such cases relapses are frequent, both being induced by psychic reasons.

**Reflexes.**—Exaggeration of reflex activity is not the general rule in hysteria. To some cases, however, and especially in traumatic cases, the tendon reflexes are hyperactive. Foot-clonus is extremely rare, and is less rhythmic and more purposive than that seen in organic spastic states.

**Sphincters.**—As a rule there is no impairment of sphincter action in hysteria. The seizure passes without involuntary micturition, and the various forms of paralysis are not usually associated with either rectal or vesical difficulties. There may be a frequent desire to urinate—a purely psychic condition; and in some cases of paraplegia there occurs a spasm of the neck of the bladder which results in urinary retention.

The other symptoms of traumatic hysteria are essentially the same as those described for neurasthenia. The same cardiac irritability and digestive disturbances are frequently observed. The respiration is often rapid, and occasionally aphonia, or hysteric mutism, in which the patient is unable to make any vocal sounds whatever, occurs. Anuria may occur, but the frequent passage of pale urine is more common. The urine shows no characteristic abnormalities chemically. The nutrition is more apt to deteriorate than in simple hysteria. The patient may become pale and lose considerable weight.

**Prognosis.**—The prognosis of traumatic hysteria has reference to two separate conditions. It is concerned, first, with the prospects for recovery in regard to the morbid mental state which is accountable for the whole disorder, and, second, with the prospect for the disappearance of the individual physical symptoms.

As regards the first consideration, the prognosis depends upon the condition of the patient's nervous system and its environment. In a person who comes of neurotic stock, or who has become weakened through the effects of disease or of alcoholism, or of any of the means of exhaustion, the prognosis for recovery is not good. The individual physical symptoms may fade away, and the patient seem to regain his health, but the conditions which favored the first development of the psychosis remain, and the patient is liable at any time to a fresh attack of acute symptoms from trivial causes.

In individuals in whom no evidences of predisposition are obtainable, and who are presumably healthy before the occurrence of injury, the prognosis is much more favorable. Such cases, if properly treated, should recover completely.

As regards the individual symptoms of hysteria, the prognosis is

almost universally good. They usually disappear at the end of a few weeks or months. To this general statement some exceptions must be made. What has been said when speaking of the prognosis of neurasthenia in regard to litigation and its inevitable associations may be repeated with added emphasis for hysteria. Although hysteria usually appears in full efflorescence soon after the injury, every form of suggestion will tend to give permanency to the symptoms; and while legal consultations, and examinations, and examinations by experts may find the patient already paralyzed or anesthetic, and so cannot be regarded as a cause of the symptoms, they furnish the strongest suggesting influences possible. Also in hysteria, as in neurasthenia, the best hope for cure consists in the ability of the patient to carry out a systematic and appropriate treatment. Such treatment is impossible while a lawsuit is pending.

**Mixed and Unclassified Forms.**—Most of the nervous disorders resulting from accidents can be classified with the affections which have been described. The symptoms of any of them may vary greatly in severity, and similar morbid conditions may, under varying circumstances, present different clinical pictures. In this country hysteria and neurasthenia are frequently associated. We have seen that the mental state in traumatic hysteria has many neurasthenic characteristics; and the mental neurasthenic state may become so hypochondriac that the patient may be best cared for in an asylum. Nevertheless most of these cases can, with propriety, be diagnosed as functional. The importance of differentiation between organic and functional disease has been mentioned. It is a distinction which can be made in most cases, but again we must make a plea for early examination by well-trained men. By such means only can ill-founded fears be abolished in the patient and vicious trains of thought brought to an end.

A word must be said of the effects of nerve shock on arteriosclerotic persons in middle life. Occasionally such cases are seen to deteriorate rapidly and to receive an augmentation of their organic symptoms subsequent to their injury. The memory defect and tremors increase rapidly. The exact relationship of the injury to these fulminant deteriorations is not clear, but may be endocrinologic in nature.

**Simulation.**—The element of simulation is so important in the medicolegal relations of disorders of the nervous system following accidents that some mention must be made of it here, although the subject will receive more comprehensive attention elsewhere in this volume. There is so strong a motive for simulation at the present time, when such large sums of money are being paid by railway and other companies for apparently trivial injuries, that corporation officers believe that, in the majority of accident nervous cases, the symptoms, if not feigned, are at least grossly exaggerated.

It is not surprising that the claim agents, or the lawyers for a company, whose medical knowledge must at least be superficial, and who so constantly are witnesses of attempted frauds, should be skeptical as to the justice of claims which are oftentimes based upon symptoms the

existence of which cannot be definitely proved. Even physicians without especial experience in general nervous disorders do not appreciate the possible gravity of such conditions. When the functional and subjective nature of the traumatic neuroses first became the subject of general interest, simulation was supposed to occupy an important place in their genesis. It was not then, however, properly appreciated that malingering is the conscious, and hysteria the subconscious, assumption of a disease picture. Suggestion and wishful thinking make gross conscious deception unusual and in a sense unnecessary in most instances.

Since statistics are derived from such varied sources it is impossible to get an exact estimate of the degree or frequency of simulation in traumatic neuroses. Many who apply to the claim agent are so clumsy in their pretensions that they are immediately recognised as frauds and consequently never reach the examining physician at all. Others are satisfied with such small compensation that the companies settle without thorough investigation. But it is unquestionable that there remains a certain number of persons who systematically defraud by feigning disease. In behalf of the correctness of this statement may be cited the adventures of the Freeman family, an account of which was printed by the Association of Railway Claim Agents. The mother (Mary Freeman) and the two daughters, Jennie and Fannie, in two years entered no fewer than nine claims for damages against railway companies. That all the claims were fraudulent and the pretenses false each and all swore before a notary in Chicago at the time of their final exposure.

Symptoms of nervous disease may be absolutely feigned, in that the claimant has received no injuries at all, or only such injuries as have been self-inflicted for the purpose of carrying out the fraud; or symptoms actually present may be exaggerated. In the first case it is pure fraud. It may also be fraud in the second, or the intentions of the patient may be honest, but the sympathy of friends and the arguments of lawyers may have brought him to believe that his condition is more serious than it really is. It is in cases in which symptoms are exaggerated and not created that the physician has the greatest difficulty. For in such the disturbances complained of are purely subjective, and the examiner may not be able to separate the true from the false.

It is in neurasthenic conditions especially that the extent of suffering is most frequently magnified. For example, a young man comes to a claim agent asking compensation for injuries received in a railway accident. It was known that he was in the accident, and that he was considerably jarred, although he received no visible injury. To the examining physician he tells the story of previous good health, but that since the accident he has suffered from pain in the back, difficulty in urinating, nervousness, sleeplessness, and inability to fix his attention upon his work. If he has been an habitual user of tobacco or alcohol he may give evidences of an irritable heart and have a fine tremor of the hands. He alleges no paralysis, no loss of sensation, nor inability to control the bladder or rectum. In cases of this kind there are no definite rules by



which the physician can decide as to the amount of truth in the allegations or as to what extent they are exaggerations. He must be guided by such collateral evidence as he is able to obtain. Claimants who tell such a story as the preceding are probably suffering to a certain extent from the effects of the accident; the amount of their injuries must be decided by contributory evidence. Pure simulators are rarely satisfied with so simple a group of symptoms and prefer to invent more striking manifestations of disease.

To feign any given condition for so long a time as a thorough medical examination requires implies a constant attention to many different things; and of such concentration and maintenance of attention few persons are capable. While the attention is fixed upon tests for sensation, the simulator may move his alleged paralyzed legs; or if pricked with a pin while his eyes are being examined he may forget his anesthesia and show evidences of pain, and thus prove that the insensibility was feigned.

When the claimant has been coached, as the Freemans evidently had been, he must choose some type of disease to simulate. If a functional disorder such as hysteria or neurasthenia be chosen, it frequently happens that the efforts to do the subject justice are so grossly exaggerated that the whole fraud becomes apparent. Paraplegia, or paralysis is from the waist down, a condition practically impossible to counterfeit, is the most popular with simulators. Fraud may be attempted by claims that symptoms were due to accident, when in reality they had existed previously. Thus the case of Peterson's, which has already been alluded to, had suffered for two years from muscular atrophy, type Duchenne-Aran. The patient received a slight blow on the head through the falling of a revolving fan, and brought suit against the proprietor of the restaurant where the accident occurred. The defendant's physician, in his examination, failed to detect the atrophy and uselessness of the hands. There was no attempt at fraud in the case, the plaintiff asking compensation for the ill effects of the shock upon the course of her disease; but it shows how easily under different circumstances she might have claimed that the disease was the direct result of the accident.

In by far the larger number of claims the amount involved is small, the claimant is willing to settle, and the companies, although they may be convinced of fraud, are put to less expense in settling the claim than they would be in defending the suit, even if it resulted in their favor. These are the considerations which make successful simulation possible.

**Means of Detection of Simulation.**—The examination of a claimant for injuries received in accidents requires much care and the consideration of many possible factors. If the nature of the trouble is perfectly plain, such as fracture of the vertebræ with resulting destruction of the spinal cord, the symptoms may usually at once be referred to the condition upon which they depend. The physician, although unbiased, should be ever on the alert for deception, and should withhold his opinion until repeated visits have satisfied him absolutely of the true nature of the case under examination. In pronounced organic cases a single

examination should tell the whole story. But in functional disorders or conditions which may be feigned it may be necessary for him not only to see the patient at different times, but also to know how he conducts himself between visits. The claimant should be made to tell his own story, and the examination should be of all the organs, and not limited to the nervous system.

It must be borne in mind that while it may be possible to simulate an individual symptom successfully, it is very difficult, if not impossible, simultaneously and consistently to counterfeit a group of symptoms resembling any clinical type of disease. He is the skilful simulator who restricts his symptoms to the fewest number possible, and chooses such as are of a purely subjective character. In attempting to imitate pronounced and well-defined morbid conditions he will almost invariably be detected by a skilful examiner. When the symptoms complained of are of a purely subjective character, the examiner can rarely be absolutely positive that they have no basis of fact, and he will find it still more difficult to prove them false.

*Motor Symptoms.*—One of the most difficult symptoms to counterfeit is paralysis. In cases following accidents it is the legs which are the most frequently alleged to be paralyzed. Acutely occurring paraplegia can be a manifestation only of hysteria or the result of injury to the spinal cord. The characteristics of hysteric paralysis have already been given. Acute spinal paralysis of organic nature is nearly always associated with loss of sensation. Retention or incontinence of urine is an invariable rule. The appearance of bed-sores is early, and there are characteristic changes in the reflexes. If seen by the physician soon after the injury, the legs will be found to be absolutely helpless and limp; when lifted up and released, they immediately drop down again. The muscles rapidly waste, give degenerative electric reactions, and may soon become contracted. A simulator will rarely consider all these symptoms, and all cannot be simulated. When the attention is distracted he may be seen to move the muscles alleged to be paralyzed. When the leg is lifted up it does not drop down with the characteristic inertness of a paralyzed leg. Fannie Freeman, when her leg was lifted up during the examination in which the fraud was exposed, forgot to let it fall, but held it in the air, thereby proving that muscular power was retained. Tremors such as are characteristic of well-defined diseases (paralysis agitans, multiple sclerosis) cannot be simulated, although they may be closely imitated in hysteric disorders, but the fine tremor which is seen in neurasthenia, alcoholism, Basedow's disease, etc., is incapable of voluntary counterfeit, although by the excessive use of such agents as tobacco, tea, and alcohol a condition of nervous excitability associated with such tremor may be induced. The heart may be rendered irritable and rapid by similar means.

Atrophy and degenerative electric reactions defy imitation.

*Sensory Symptoms.*—It is toward the domain of sensation that the effort of the simulator is most frequently directed, and it is there that they have the best chances of success. Pain is a symptom in the main

subjective; for although it may leave its traces in the face of the sufferer and interfere with sleep and so upset nutrition, even in the absence of these objective signs it is impossible to prove that pain does not exist. Without evidence to the contrary, such as might be furnished by nurses or attendants, the physician cannot deny the existence of pain, although he may doubt it. If in its location or character the pain is different from that usually observed in connection with such other symptoms as the patient may present, suspicion as to its reality will naturally be roused. Thus the pain in traumatic lumbago is not severe as long as the patient remains perfectly still; if such a patient should complain of continuous intense pain in the back, its genuineness should at once become questionable.

Analgesia, or loss of sensibility to pain, is a very common symptom in disorders of the nervous system. Aside from its occurrence in well-recognized functional and organic diseases among the insane and degenerate, there are some persons who are born with very slight development of the pain sense. Women are less sensitive to painful stimuli than are men; and in museums men (popularly called "human pin-cushions"), who have complete and profound analgesia and who appear healthy in other respects, are the recipients of generous salaries. The Jewish race, and especially the Polish and Russian Jews, have slight susceptibility to pain, although in them it may be a hysteric stigma. For persons thus protected it would seem comparatively easy to pretend that their insensibility to pain was the result of accident. With blunted sense it would require less attention to refrain from evidence of pain perception. Absence of pain sense may also unquestionably be assumed. One can educate oneself to resist the tendency to give expression to the pain which has been felt. This deception may be cultivated to a high degree; for its detection it is only necessary to take the subject unawares. When his attention is attracted to the examination of the muscles or reflexes a sharp and unexpected prick with a pin in the back will cause him to jump. Or if, when using the faradic battery, a mild current is suddenly changed to a moderately strong one, there will usually result expressions of discomfort if the pain is really felt. Changes in pulse-rate during examination are not infallible and are of negative value; for the pulse may become more rapid simply through fear of pressure on a tender spot, or the pulse-rate may remain unchanged when pain is really caused by such pressure. Also a variation in the limits of alleged anesthesia cannot be considered as conclusive evidence of simulation, because such variations may occur both in hysteria and in organic diseases. Defects of touch and temperature are less frequently simulated than that of pain; their counterfeiting may be discovered by means similar to those for detecting analgesia.

*Special Senses.*—The only one of the special senses of which disordered function need be considered here is the eye in respect of the field of vision. It seems probable that anyone who is familiar with the methods of testing the visual field could simulate either concentric or shifting contraction. But slight concentric contraction or even shifting



contraction is not pathognomonic of any one condition, and the simulator might betray himself by too gross exaggeration of the symptoms, or, by being taken off his guard during the examination of the eyes, he would betray the falseness of other symptoms. The diaphragm test is of especial value in detecting simulation of one-sided blindness. Here a card has to be read through a small aperture placed near the eyes; the whole legend is thus visible to both eyes, the right half of the card to the left eye, and vice versa. For one unacquainted with the test and the principle of diagonal projection, detection is certain. Organic blindness is almost always accompanied by objective changes in the pupil or the optic nerve.

*Reflexes.*—Loss of reflexes cannot be simulated (take, for example, the knee-jerk). The leg may be held so stiffly that it does not respond to the tap on the patella tendon. But this does not show a loss of knee-jerk; and if the person under examination be made to look away from his legs and pull his hands strongly apart, his attention will be distracted from his legs, and the knee-jerk, if the structures upon which it depends are unimpaired, can be elicited. Increased reflexes are easy of imitation; but increased reflex activity is met with in so many different disorders, as well as in persons apparently normal, that it is by itself of but little importance. When associated with foot-clonus, and changes in plantar reflexes, its significance is greater; but foot-clonus, when the leg is held in the air by the examiner, cannot be simulated.

*Trophic disorders* can be simulated only by the use of external agents, such as chemicals, hot irons, etc.

*Bladder and Rectum.*—Retention of urine can be simulated only at considerable inconvenience to the simulator. Percussion will readily show whether the bladder is free; if filled, slight pressure on the suprapubic region will cause urine to appear at the meatus.

Patients with urinary incontinence pass water at frequent intervals, and in such cases, however careful the precautions of cleanliness, a urinary odor is unavoidable; so that the person claiming to have lost control of the vesical function, and who is not surrounded by an odor of urine, is open to suspicion.

Incontinence of feces can readily be discovered by inserting a finger in the rectum, for such incontinence is due to laxity of the anal sphincter, a condition readily appreciated on digital examination.

# SPEECH DISORDERS

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A CONSIDERATION of the forensic aspects of speech disorders should have as a basis a knowledge of the main facts pertaining to normal speech, a brief résumé of which will here be in order.<sup>1</sup>

**Normal Speech Processes.**—By common consent the term "speech" as a cerebral function has come to be synonymous with "language," although the two are evidently quite distinct, "language bearing the same relation to spoken speech that music does to dancing—*i. e.*, it *decides the movement* by which it is expressed."<sup>2</sup> It is in the sense of the reception, elaboration, and emission of *language*, therefore, that the term speech is here used.

Normal speech, in this sense, embraces the capacity correctly to *receive, understand, and convey* to others *ideas* represented by words, which words may be spoken, written, printed, or indicated by signs.

To use a familiar example, the idea of a fish (see Fig. 172), correctly received, understood, and expressed, comprises:

1. *Reception of sensory impressions* conveyed through organs of sight, smell, taste, hearing, touch, weight, and temperature senses to appropriate brain areas, where they become percepts.

2. *Association* or combination of these various sensory impressions and other percepts—*i. e.*, water, cooking, dishes, etc.—to make the "concept" or idea "*fish*." Here, also, would come the association with its name, considered by some (Mills,<sup>3</sup> Broadbent, Charcot, Kussmaul) to be a distinct faculty in itself.

3. *Expression*, composed of two distinct factors—viz.: First, the purely "psychic" act of word construction or planning, comparable to the planning of a house by the architect; second, psychomotor or executive processes, leading to *emission* of the word fish—spoken,

<sup>1</sup> Our knowledge of localization of speech processes in separate brain areas dates practically from 1861, when Broca first located the faculty of spoken speech in "the posterior part of the third frontal convolution of the left hemisphere." This view he established, for the time being, by two autopsies on aphasic patients at the Bicêtre Hospital. Since his time the subject has been much elaborated and brought to its present advanced, though far from complete, state through the labors of Falret, Trousseau, Charcot, Marie, Moutier, and others in France; Wernicke, Kussmaul, Simon, and others in Germany; Benedikt in Austria; Hughlings Jackson, Broadbent, Gowers, and Bastian in England; while our own country is represented by the labors of Austin Flint, Bigelow, Starr, Mills, and numerous others.

The most important general works on the subject in the English language are those of Bateman, *On Aphasia, etc.*, London, 1890; Wyllie, *The Disorders of Speech*; Edinburgh, 1894, and Collins, MacMillan, N. Y., 1898.

<sup>2</sup> Wyllie, *The Disorders of Speech*, Edinburgh, 1894.

<sup>3</sup> Dercum, *Text-book of Nervous Diseases by American Authors*, Lea, Phila., 1895, p. 427.

written, printed, drawn in outline, or indicated by pantomime. These latter processes are analogous with the building of the house by various workmen from the plans previously made.

Expression here resembles all the other known forces in that it is merely a "mode of motion."

The diagram (Fig. 172) shows in concise form the general relationship of the processes just mentioned.

**Anatomic Basis of Speech Processes.**—According to modern and generally accepted doctrines, the anatomic and physiologic units of the nervous system are structures called "*neurons*" (Fig. 173).<sup>1</sup>

These are protoplasmic structures, microscopic in size, consisting of an enlarged portion called the "*body*" (formerly known as a nerve

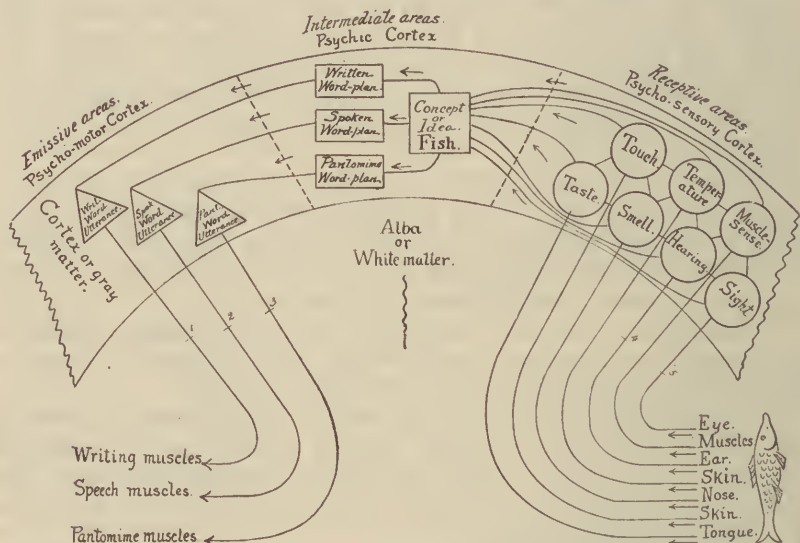


FIG. 172.—Scheme of receptive, intermediate, and emissive mechanisms of normal speech (language). Numbers 1, 2, 3, 4, 5 indicate situation of subcortical brain lesions destroying reception or emission by one or more paths, without impairing sensory memories, concept memories, language construction, or utterance memories. It should be clearly understood that the circles, squares, and triangles do not represent groups of neurons (cells), but more probably areas or "fields of conjunction" of neuron-processes (end-tufts) (see Fig. 173 for illustration of this).

"cell"), from which proceed elongated processes in various directions. These processes present near their terminations small swellings called "gemmules" or "contact bulbs." The view has been advanced that these "contact bulbs" possess the function of extension and retraction, by "ameboid" movement or otherwise, and that to this movement are due the "make" and "break" of contact and consequently of function observed in various states,<sup>2</sup> by means of which impressions are pre-

<sup>1</sup> It may be well to state that the term "neuron" is here used in the sense indicated by Waldeyer. Some confusion respecting the scope of the term exists by reason of the fact that Schafer and perhaps some other writers have applied the term "neuron" to the neuraxon (one of the neuron processes). Waldeyer's nomenclature, however, is now generally accepted throughout the world.

<sup>2</sup> Vide Dercum, *Journal Nervous and Mental Disease*, 1896, p. 513.



sumed to pass from neuron to neuron throughout the nervous system. It is not at all necessary, however, to assume an anatomic change of relation for this "make" and "break" mechanism. Minute changes in chemical constitution of the terminal end-tufts would be quite as effective and more conceivable to the present writer. In normal speech processes chains of such neurons, commonly composed of two or three individuals linked together, conduct sensory impressions from without

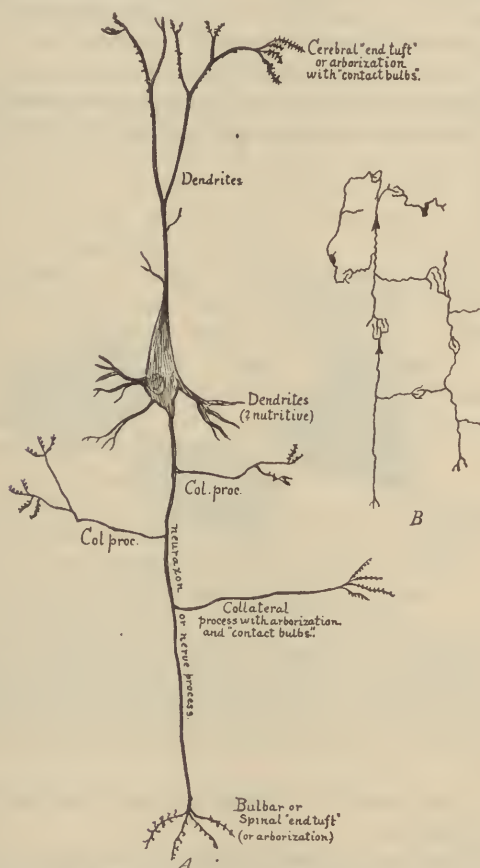


FIG. 173.—The neuron of Waldeyer: A, "pyramidal" neuron of the motor cortex, highly magnified (semidiagrammatic); B, Communications of neurons with each other by means of end-brushes (tufts or arborizations). The contact bulbs or gemmules are omitted in the small figure.

to the brain cortex, where they become a part of consciousness. Here neurons, parts of neurons, or other chains of neurons convert percepts into concepts (ideas), concepts into word-plans, and word-plans into motor impulses. These motor impulses are transmitted through other (outgoing) chains of neurons to the various muscles of respiration, phonation, and articulation to produce spoken words. Presumably each neuron and each chain of associated neurons possesses a separate

and distinct function, though this is not, at present, susceptible of actual proof as regards speech processes. It is probable that the more numerous and complete the communications and interrelations of the neurons, the more varied will be the sources of language and the more nearly perfect its elaboration, other things being equal. Differences in the complexity of organization and interrelations of neurons therefore probably constitute the natural differences in individuals as regards range and command of language. It is probable that the subject of speech disorders will eventually be considered from the standpoint of the neuron, as nervous diseases in general now are.

At present, however, for practical purposes, the areas of brain cortex which are especially concerned with speech processes are five in number, and, as shown in the accompanying diagram (Fig. 174), they are educated for speech purposes on the *left half only* of the brain in *right-*



FIG. 174.—Left cerebral hemisphere, showing receptive speech areas, *A*, Word-hearing; *V*, word vision; and emissive speech areas, *M*, motor; *G*, graphic. A fifth area, *N*, intermediate in order of function between the receptive and emissive areas, has been described by Mills<sup>1</sup> as the "naming center," and a case reported by him to favor this view. Connections (commissures) by means of associative mechanisms are believed to exist between each of these areas. These commissures are probably paired—*e. g.*, one set passing from *A* to *V*, another from *V* to *A*, etc. Lesions of these commissures cause the various forms of paraphasia (intermediate or "conduction" aphasia) (modified from Wyllie).

*handed* persons. In most left-handed persons the right half contains the speech mechanisms.

Presumably, the neurons concerned in the various subdivisions of the speech process are grouped, each division to a considerable extent aggregated, but connected by neuron processes of various kinds (collaterals, dendrites, etc.) with each of the other groups. According to modern views, the chief seat of nervous activities proper (sensation, motion, thought, etc.) is at the points of contact between the end-tufts (fields of conjunction), not at the neuron bodies ("nerve-cells"), as was until recently taught. The neuron bodies (formerly cells) are now believed to bear chiefly a nutritive relation to the more active neuron proc-

<sup>1</sup> Vide Mills and McConnell, *Journal of Nervous and Mental Disease*, 1895, xxii, 1.

esses. These neuron processes again are not simple homogeneous structures, but are resolvable microscopically into aggregations of minute fibrillæ, each one of which presumably contributes its individual share to completeness of neuropsychologic activities.

A hypothetic material substance called the "synapse" (pl. synapses) has been postulated as intervening between the terminal surfaces of neurons, through which is carried on the "transference of impulses" (activities) from neuron to neuron. The existence of some such substance and its possible functions raises the ancient question of the location of consciousness itself, but this is not the place for a general psychologic discussion.

To the receptive areas come entering sensory impulses, traversing the neuron chaînes extending from the corresponding external sense organs (ear, eye, etc.).

From these receptive areas of the brain cortex pass neuron processes connecting one area with another and with various other regions of the brain mass (intermediate and emissive areas). Finally, from the emissive (motor) areas only pass impulses through other neuron processes to the base of the brain (bulbar nuclei, etc.), where, communicating with a second set of motor neurons, they are conveyed to the muscles of expression, which they animate and control (see Figs. 172, 173).

Hence it follows that even a limited damage to the brain from any cause may impair or destroy the functions or connections of one or more groups in the language area, thus giving rise to speech defects of varying degree and importance.

The study of speech and its disorders thus belongs both to neurology and to psychology, and obviously requires a knowledge of the anatomy, physiology, and pathology of the brain and its connections, with capacity for judging of their activities in health and disease.

Since the publication of the first edition of this work an important volume of some 700 pages, entitled *L'Aphasie DeBroca*, by Dr. Francois Moutier (Paris, G. Steinheil, pub. 1908) has appeared. It is based on extensive researches by Pierre Marie and his students, one of whom appears in the title of author. Items pertinent to our present subject are:

1. Rejection of *pure motor aphasia*—or the "Broca syndrome" as a clinical entity.

2. The denial that the left third frontal convolution (alone) is the seat of motor speech processes—and reference of the production of "motor aphasia" (anarthria) to lesions of the lenticular zone and external capsule (which are subjacent to the third frontal).

3. The rejection of the subcortical forms of aphasia as "presumptive" and not proved. As this is not a proper place for controversial discussion, it must suffice to say here that the evidence adduced is of great interest, though not entirely convincing. It admonishes the neuropsychologist, however, that the subject is not a "closed chapter," and that continued study of concrete cases and careful weighing of all evidence is essential to its final elucidation.



## LIMITS OF LEGAL IMPAIRMENT

The literature of the jurisprudence of aphasia is rather sparse in comparison with the voluminous amount of matter in print pertaining to the subject of aphasia in general. Bateman<sup>1</sup> states that there is "No code or law as to the legal capacity of aphasics in this (Great Britain) or any other country, . . . and that each particular case would have to be considered on its own merits." It is quite evident that the limits of legal impairment differ widely from those of impairment in a purely physiologic sense. Physiologically, aphasia of any degree is to be looked upon as a break in the relationship of the individual to his environment; hence his general intelligence must suffer to some extent. It is quite reasonable to assume, however, that the degree of mental impairment in a given case may not be sufficient to be classed as insanity, nor yet be such as to prohibit the transaction of ordinary business affairs or the making of a valid will. It is quite evident that one of the receptive centers may be damaged or destroyed without necessarily abolishing the function of others. One receptive area, then, may take the place of another that is disabled—sight, for instance, by enabling the subject to receive ideas by written, printed, or sign language may compensate for loss of word hearing. A tailor, for instance, may not recognize the spoken word coat, though he hears it as a sound; he may, however, recognize the printed or written word, and also recognize the coat when seen and know its use and value. Such a case is cited on page 469.

Even with the hearing and visual areas both destroyed by disease or absent from congenital defects it may still be possible for the patient to recognize words by the muscular sense, as in the act of tracing the letters with his hands. The education of the individual would here be an important factor in deciding a given case, since a person who could not write could not avail himself of the help of graphic and muscular sense association.

An example of extensive replacement of the auditory and visual receptive mechanisms by the tactile and muscular senses is furnished in the case of Miss Helen Keller, who some time ago passed with credit the entrance examinations to Radcliffe (Woman's Annex to Harvard College).

For the following notes on this case the writer is indebted to the courtesy of Mr. Michael Anagnos, Secretary of the Perkins Institution and Massachusetts School for the Blind, where the young lady received her education. Miss Keller, who is now (October, 1922) aged forty-two years and four months, lost her sense of hearing (peripheral?) from a severe fever at the age of nineteen months; shortly after this she ceased to speak. She was taught to read the words of a speaker by placing two of her fingers on his lips; also by the "manual alphabet" (for deaf and dumb). She conveys language to others—(1) by the manual alphabet; (2) by articulation of words learned by the lip-touching process above

<sup>1</sup> On Aphasia and the Localization of the Faculty of Speech, London, 1890, p. 302.

mentioned. Her articulation is said to be very distinct. Her senses of smell, taste, and temperature are highly developed, and her powers of memory are unusual. See also *Who's Who in America*, 1921, for her remarkable later career.

Smell and taste are of less importance in the construction of language concepts, being applicable to a more limited range of concepts than hearing, sight, and muscular sense. In rare cases, however, their conditions may be of importance as bearing on the presence of hallucinations or illusions that would impair the reliability of the individual in a given case.

The question of the location of special psychic word-smelling and word-tasting centers cannot, in the present state of our knowledge, be raised. Word-feeling areas would seem to have a necessary existence in educated deaf blind persons, but their location remains unknown, though supposed to be in the inferior parietal convolutions and gyrus fornicatus of the left hemisphere.

It is quite evident from these general considerations that a conclusive opinion in a given case is admissible only after a thorough examination of the functions of the receptive, intermediate, and emissive mechanisms by a competent neuropsychologist. It should not be forgotten that the language defects of some aphasias may lead to erroneous committal to an asylum, and eventually to civil suit for damages.

Sanity having been established, the questions of jurisprudence which are most apt to arise in cases of aphasia fall naturally under two heads:

**1. Responsibility for Acts Done.**—(a) Contracts already made, including contracts of marriage, business contracts, and contracts made as a member of a partnership or officer of a corporation and affecting such partnership or corporation.

(b) Wills and testamentary acts.

(c) Acts as a public official.

(d) Evidence given as a witness, the value and weight to be attached to it.

(e) Execution of deeds, mortgages, or powers of attorney.

(f) The involuntary use of improper or obscene language, as in the case cited on page 450.

**2. Competency Legally to Perform Proposed Acts.**—(a) To make contracts in an individual capacity or as a member of a firm or officer of a corporation, and to carry on business generally.

(b) To make a will or codicil or to vary the terms of former testamentary acts.

(c) To exercise the functions of a public official.

(d) To testify in judicial or quasijudicial proceedings.

(e) To execute deeds, mortgages, or powers of attorney.

(f) To choose place of domicile; to acquire a settlement (in a poor district or an eleemosynary institution).<sup>1</sup>

<sup>1</sup> For valuable suggestions regarding the foregoing legal relations of aphasia the writer is indebted to Mr. Joseph Cox, Jr., of the Cincinnati Bar.

## DISORDERS OF SPEECH PROCESSES

Passing to a consideration of the disorders of speech from brain disease or injury, the term aphasia is used as a general expression to signify speech loss, partial or complete, whether affecting the receptive (sensory) elements, the intermediate (constructive) apparatus, or the emissive (motor) mechanisms of the brain cortex.

The following scheme of varieties of aphasia may be found useful as indicating the relationship of the various forms, although it includes some types not yet recorded as separate existences—viz., word-anesthesia; pantomime-blindness; and pantomime-forgetfulness.

With the scheme on p. 449 as a working basis, a consideration, *seriatim*, of the various types of aphasia in their forensic aspects will now be in order.

**The Receptive or Sensory Aphasias.—1. Word-deafness.**—The *lesion* is in or beneath the posterior third of the first and second temporal convolutions of the *left* hemisphere (Fig. 174, A). It may be due to congenital defect, softening from vascular occlusion, destruction and pressure by inflammation, abscess, hemorrhage or tumor, and finally to degenerative changes (paresis, senility). Of these, by far the most frequent form is that due to softening from vascular occlusion. The *effect* on the patient is that he fails to recognize word-sounds as *words*, though he hears them as *sounds*. He may also utter words, but without relevancy to the words received, and he fails to recognize this irrelevance. Such a person obviously cannot understand spoken speech, hence any answers he may give to oral questions have no value in a legal sense.

Much depends on the situation of the lesion in word-deafness: (1) It may destroy the cortical area itself (cortical word-deafness), in which case the word-memories are gone and consequently of no use to the patient either in receptive or associative processes. (2) The lesion may be so situated as merely to cut off the incoming fibers (neuron-processes) *below* the cortex (Fig. 174, subcortical word-deafness, commonly accompanied by hemianopsia). In this case the word-memories exist in the cortex and may be in communication with other inlets as well as outlets. In other words, they may be *revived* by visual, gustatory, olfactory, tactile, or muscular sense impressions. If so revived, they may be emitted intelligently by spoken as well as by written or mimic language, provided these other speech areas be intact.

Even in the cortical form of word-deafness it is evident that the *nature of the acts* under consideration is a factor of great weight in the decision as to competency and responsibility. For instance, in devising a will, the ordinary attachments and known natural affections of the individual may be accepted as evidence of the validity of a will which did no violence to those inclinations. In other words, the emotional “tone” on which the affections depend may remain intact, even with judgment more or less at fault. This is a well-recognized fact with regard to cerebral *motor* processes, where the power of “emotional” expression may animate muscles that are not under control of the will. The generally accepted explanation is that “emotional” motor processes



Receptive or "sensory"	Auditory aphasias. . . . .	1. Amnesia verbalis	(Word-deafness)	Non-recognition of word-sounds.
		2. Anusia	(Music-deafness)	Non-recognition of musical sounds.
		3. Auditory apraxia	(Object-deafness)	Non-recognition of object sounds.
		4. Alexia	(Word-blindness)	Non-recognition of word meanings— (may exist for printed and written words separately).
	Visual aphasias. . . . .	5. Visual apraxia	(Object-blindness)	Non-recognition of object meanings or object uses.
		6. Visual amimia	(Pantomime-blindness)	Non-recognition of word mimicry or idea mimicry.
		7. Cortical anosmia	(Smell-memory-loss)	Non-recognition of objects by smell.
		8. Cortical ageusia	(Taste-memory-loss)	Non-recognition of objects by taste.
	Auditory paraphasias. . . . .	9. Myotactic alexia	(Word-anesthesia)	Non-recognition of word-movements by finger or pen.
		10. Myotactic amimia	(Pantomime-anesthesia)	Non-recognition of mimicry by touch.
		11. Myotactic apraxia	(Object-anesthesia)	Non-recognition of objects felt.
		12. Paraphasia verbalis	(Spoken-word-forgetfulness)	Non-recognition of word-sounds.
	Auditory paraphrasias. . . . .	13. Paramusia	(Musical-sound-forgetfulness)	Non-recollection of musical sounds.
		14. Auditory parapraxia	(Object-sound-forgetfulness)	Non-recollection of object sounds.
Intermediate or "conduction"	Visual paraphasias. . . . .	15. Paralexia	(Word-meaning-forgetfulness)	Non-recollection of word meanings— (may exist for printed and written words separately).
		16. Visual parapraxia	(Object-meaning-forgetfulness)	Non-recollection of object meanings.
		17. Parosmia	(Smell-memory-forgetfulness)	Non-recollection of smell meanings.
		18. Parageusia	(Taste-memory-forgetfulness)	Non-recollection of taste meanings.
	Auditory paraphrasias. . . . .	19. Myotactic paramimia	(Pantomime-forgetfulness)	Non-recollection of mimicry move- ments.
		20. Myotactic parapraxia	(Object-touch-forgetfulness)	Non-recollection of feel of objects.
		21. Anomia	(Name-memory-loss)	Non-recognition of names of objects.
		22. Paranomia	(Name-forgetfulness)	Non-recognition of names of objects.
	Concept aphasias. . . . .	23. Psychic motor aphasia	(Spoken-word-construction-loss)	Loss of psychic spoken-word plans.
		24. Executive motor aphasia	(Spoken-word-utterance-loss)	Loss of motor word memories.
	Written. . . . .	25. Psychic agraphia	(Written-word-construction- loss)	Loss of psychic written-word plans.
		26. Executive agraphia	(Written-word-utterance-loss)	Loss of motor written-word memories.
Emissive or "motor"	Pantomimic. . . . .	27. Psychic amimia	(Pantomime-construction-loss)	Loss of psychic mimicry memories.
		28. Executive amimia	(Pantomime-utterance-loss)	Loss of motor mimic memories.

are bilaterally represented in the brain and may act from either side. It is conceivable that the same relation may exist with respect to emotional "psychic" processes.

It is probably reasonable to assume, therefore, that testamentary capacity may exist in a given case, even where the transaction of a complicated business and the appearance as a witness in important cases might be detrimental to the interests of the patient or of society at large.

The use of outrageous, improper, or obscene language by such a patient is obviously not attended with the usual responsibility for the act, as in a case recorded by Trousseau of a lady, who, without any accompanying paralysis, presented the following perversion of speech: On receiving a call from a visitor, she rose to receive him with a benevolent smile on her countenance, and, pointing to a chair, said, "Pig, brute, stupid fool." "Madame B—— begs you to be seated," said a relative who was present. . . . Trousseau adds that the acts of this lady seemed logical and sensible, and, strange to say, she did not seem to be aware of the foul language she was using.<sup>1</sup> This was apparently a case of word-deafness associated with paraphasia verbalis.

The fact that agraphia or paraphasia commonly accompany word-deafness probably depends on the accompanying word-forgetfulness (paraphasia verbalis), which is common. Even in the absence of this auditomotor paraphasia or word-forgetfulness the proximity and probable involvement of the word-vision center (supplied by the same artery) would be liable to lead to some confusion in writing, since the patient must depend solely on his muscular sense memories of written words. It must be borne in mind, finally, that word-deafness is, of all the common forms of aphasia, the most susceptible of recovery to a marked degree; partly from escape of some portion of the word-hearing area or its entering fibers from destruction; partly from subsequent education of the corresponding area in the right hemisphere. The state of the patient's auditory perception, therefore, *at a given time*, is an important point.

The general capacity of the word-deaf aphasic, therefore, depends on his ability correctly to substitute for the lost word-hearing some other sensory word-image derived through vision, smell, taste, tact, or muscular sense; and correctly to express his wishes by means of *written* or *mimic* speech. In the case of subcortical word-deafness the *expression* may possibly be correctly accomplished by spoken speech, even though the patient does not hear his own words.

2. **Amusia** is analogous with word-deafness in that the musical notes are heard as sounds, but not recognized as music. Its chief importance lies in the fact that it is likely to be associated with or to be followed by word-deafness and paraphasia verbalis, since the music-hearing area is believed to lie immediately anterior to the word-hearing area in the first and second left temporal convolutions.<sup>2</sup>

<sup>1</sup> Bateman, On Aphasia, etc., 1890, pp. 201, 202.

<sup>2</sup> Edren, Deutsche Zeitschrift für Nervenheilkunde, Bd. vi (Analysis of 52 cases quoted by Fränkel, Journal Nervous and Mental Disease, 1895, xxii, 123).

3. **Auditory apraxia** or **object-deafness** is characterized by non-recognition of objects by their sounds—as, for instance, of a dog, by his bark, or of a bell, by its note. It may accompany the two preceding varieties or exist separately. The lesion is believed to be in the posterior portion of the first and second left temporal convolutions (Fig. 174, A), and to be more extensive superficially and subcortically than the lesion in pure word-deafness. Its chief forensic importance lies, of course, in its frequent association with other auditory aphasias.

4. **Word-blindness** and (5) **object-blindness** are apt to occur together in varying degrees. The lesion is in the “angular gyrus” (Fig. 174, V). No distinct line of demarcation is known to exist between these two forms of visual aphasia, though they are clinically distinct in some cases. Hemianopsia is apt to be an associated symptom in both, especially if the lesion be subcortical in situation or effect. The nature of the lesion may be either of the pathologic conditions noted under word-deafness. The *effect* on the patient in word-blindness is that he fails to recognize printed or written words *as words*, though he sees them as marks or lines. Likewise in object-blindness, also called “mind-blindness” and “soul-blindness”—improperly it seems to the writer—common objects convey no meaning of their *nature* or *use* when *seen*, though they may be at once properly appreciated if felt and handled—muscular-sense recognition.

Mere object-blindness must be carefully distinguished from *anomia* (see No. 21, p. 449), or loss of *name* memories, since a case reported by Mills indicates that the two are apparently distinct.

It is evident that verbal responsibility exists in these patients, provided that the aphasia is visual only, and that no serious mental defects complicate the case. Also that testamentary capacity remains, so that the person may properly dictate the items of a will or the terms of a contract, and carry on business of such a nature that he is not required to read or to judge of objects by sight.

It must be noted, however, that the inability to read renders him peculiarly liable to fraudulent impositions, and that in the case of will-making the witnesses should be especially well qualified, should understand the terms of the document, and satisfy themselves that the testator understands it by reading it aloud to him, in addition to the ordinary witnessing of the signature or mark of the testator.

His signature, being made by the aid of the muscular and “graphic” memories, is, of course, acceptable; although he may be unable to read it *by sight*, he can do so by the hand-movement (*muscular sense*) memories of directing the pen.

Such a patient may also make a holographic will and read it in the same manner as he produces it.

6. **Visual amimia** or **pantomime-blindness** is not yet recorded as a separate type. The patient would be unable to recognize mimicry of words or ideas. The condition must be very rare, since it seldom accompanies even complete auditory and motor aphasia, combined with some visual apraxia. The most probable seat of the lesion would be



in the postparietal region, behind the motor areas proper, and it would seem almost necessary for the lesion to be bilateral.

7. **Cortical anosmia** (smell-memory-loss) and (8) **cortical ageusia** (taste-memory-loss) would also probably require bilateral lesions situated in the "tip" of the temporal lobes, inner surface (uncinate gyrus). Their medicolegal importance would be, of course, unimportant.

9. **Word-anesthesia**; (10) **Pantomime-anesthesia**.—Pure cases of these forms of aphasia have not, so far as the writer is aware, been reported. The location of the lesion which would cause these disorders is as yet uncertain, the tactile, muscular, and temperature sense areas being considered by some investigators (Starr, Ransom, Dana, Mills, Lloyd, Deaver) to be situated in the postparietal area (Fig. 174 above V) adjoining the motor convolutions for the trunk and extremities; by others (Horsley, Schafer, Saville, Ferrier, Yeo) also to extend to the limbic lobe (gyrus fornicatus) and hippocampal gyrus on the inner surface of the hemisphere.

These functions are probably bilaterally represented for ordinary purposes, but it is quite conceivable that, in the case of the finer tactual manipulations, as in reading the blind alphabet, etc., there may be—probably is—a specially educated center on the left side corresponding to the other language areas. A case illustrating the probable relation of the postcentral (ascending parietal) and parietal gyri to finer tactile and muscular sense perceptions recently came under the writer's observation through the kindness of his colleague, Dr. N. P. Dandridge. The man had his skull fractured by a brick, the wound involving the left parietal bone and necessitating the removal of a triangular area of bone (about  $2\frac{1}{2}$  inches in extent in each direction) over the leg and arm regions of the cortex. The dura was not opened. There was marked motor weakness, but no speech defect following the operation. The motor weakness affected the right leg, arm, and face muscles, diminishing in severity in the order named.

Complete loss of voluntary power over the anterior leg muscles existed—simply marked weakness of arm and face movements as compared with the opposite side. The knee-jerks were present, somewhat overactive on both sides.

With his eyes closed it was impossible for him to name correctly coins and common objects with his right hand, or even to tell their general form. He said a coin, for instance, was a "half moon." With his unaffected hand he could recognize not only the shape but the value of the coin.

As the case progressed favorably the return of power in the right leg, arm, and face was complete in two weeks, and was accompanied by return of muscular sense, so that coins and other objects could be correctly recognized with either hand.

11. **Object-anesthesia (Myotactic Apraxia)**.—Burr<sup>1</sup> records a well-marked case of this form associated with visual apraxia (see No. 5, page 449), and refers to another. In neither case was ordinary touch-pain

<sup>1</sup> Journal Nervous and Mental Disease, May, 1897, 260.

or temperature sense deficient. While no precise localization of this rare lesion can be made at present, it is reasonable to infer, from its association, that it is not far from the angular gyrus (Fig. 174, V).

The *effects* to be expected from tactile and muscular sense lesions are, of course, unimportant in a legal sense, excepting in the case of blind deaf-mutes, communication being then possible only by a very limited pantomime, which would itself be impaired if not abolished by the muscular sense lesion.

**The Intermediate or "Conduction" Aphasias.**—Our second group, the **intermediate aphasias**, are commonly known as "conduction" aphasias, which term was used by Wernicke to designate errors in the transmission of sensory language images from the receptive to the emissive (motor) areas. By some (Bastian) they are referred to as "commissural aphasias." Both terms seem objectionable to the writer, since "conduction" may also imply a lesion in the tract from the motor centers to the basal ganglia (subcortical and capsular lesions; and commissural is equally open to objection as applicable to the connections between the two hemispheres, which are commonly known as commissures. The term "intermediate" is here used, therefore, in a functional sense to indicate the chronologic order of the processes involved. The "intermediate" aphasias in this sense comprise the paraphasias in general, together with anomia or concept aphasia. The leading characteristic of the paraphasias is that spoken word-memories, visual word-memories, etc., are correctly *received*, recognized, and *retained* in their appropriate areas, but are *lost in transmission* to the motor areas. Hence the word emitted is not properly related to the word received; or wrong words are emitted unintentionally. "Amnesia verbalis" and "amnesic" aphasia are terms that have been applied to these forms, but amnesia (memory-loss) at the receptive area does not really exist; as above explained, it is transmission to and *recollection* at another (psychic or motor) center that is at fault. In other words, the train starts but does not arrive, owing to imperfection in the track. The patient can hear, understand, and speak correctly, but his answer is apt to be ill-chosen and irrelevant to the question asked; at the same time *he is aware of the irrelevancy*, though he cannot correct it by spoken words.

The term *word-meaning-forgetfulness*, which I have chosen to indicate this type, is a cumbersome expression, but plain English in its meaning, and is used by Wyllie in the same sense. *Non-recollection* aphasia would be equally correct.

*Word-deafness* is necessarily accompanied by paraphasia (word-forgetfulness), but the converse does not hold true, as numerous cases attest. This is apparent from the subjoined diagram (Fig. 175), which illustrates the locations of the lesion in the types of word-deafness, word-forgetfulness, and motor aphasia.

From this it is apparent also that subcortical lesions may give rise to *conduction* defects, without any loss of word-recollection. In other words, paraphasia properly is a defect of association, not of conduction in its general sense.

12. **Spoken-word-forgetfulness**, as an isolated form of aphasia, is due to a lesion in or beneath the insula (island of Reil), as shown in the diagram (Fig. 175). It causes the patient to utter words incorrectly or irrelevantly to those received. He recognizes his errors, however, by means of the intact word-hearing area; though unable to correct them by *spoken* speech, he may do so by writing or pantomime. This is an important difference between this form and simple word-deafness, since in the latter the errors are unrecognized and go uncorrected.

Not only may a definite and demonstrable lesion cause this and other forms of paraphasia, but simple "general enfeeblement" of the brain (Wyllie) may also be attended with like results. This is one explanation of the existence of word-forgetfulness in advanced age and also as fol-

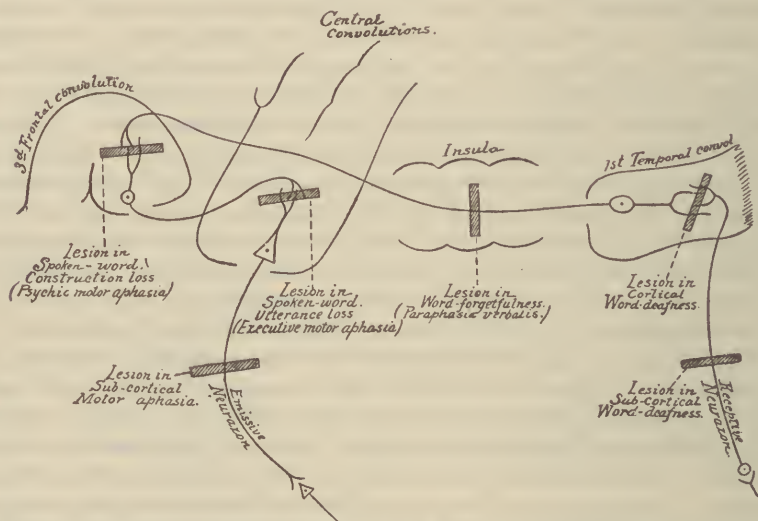


FIG. 175.—Diagram to illustrate probable relations of types of auditory aphasia, paraphasia, and the motor aphasias. A substitution of other sensory and motor areas and their connections would illustrate any of the remaining types of receptive, intermediate, and emissive aphasias.

lowing exhausting diseases. In such cases we must assume an impaired nutrition in the associative (intermediate) mechanisms or neuron processes. The same general remarks apply to—

13. **Paramusia** and (14) **auditory parapraxia**.

15. **Paralexia**, non-recollection of word meanings, or loss in transit to emissive areas, may apply to printed and written words (paragrammia) separately; hence both should be tested. The pure form would probably be due to a subcortical lesion beneath the angular gyrus (Fig. 174, V).

Simple paralexia by itself is of less consequence in a legal sense, since the remaining auditory (receptive) and spoken-speech (emissive) centers are sufficient for practical purposes.

16. **Visual parapraxia** would be similar in effect and location as the preceding (15), object-defect being substituted for word-defect.



17. **Parosmia** and (18) **parageusia** would possess clinicopathologic importance only; see (7) and (8) for probable location, etc.

19. **Myotactic paramimia** (**pantomime-forgetfulness**) and—

20. **Myotactic parapraxia** (**object-touch-forgetfulness**) need only to be mentioned. They would probably bear a subcortical relation to the areas affected in myotactic amimia and apraxia (postparietal convolutions(?)).

The legal relations of the various types of paraphasia will naturally vary within wide limits and cannot be definitely outlined. The actual state of the individual case and the concomitant circumstances must be weighed carefully in every such instance. A simple paraphasia verbalis is not in any way incompatible with holographic will-making, since the auditory and visual receptive centers are both intact and may still be in relation with the graphic area. A deep lesion of the insula, however, in auditomotor paraphasia (spoken-word-forgetfulness) may also cut off the communication with the graphic area, in which case the visuographic mechanisms may not suffice for correct conveyance of ideas. It must be borne in mind, moreover, that deep lesions of the insula are also apt to affect the striate body and the internal capsule, and in this way interfere with graphic as well as spoken emission on the same side. Even this would in some cases leave the opposite graphic motor area (for the left hand) available for simple written expressions of assent and dissent at least.

Finally, of the entire group of paraphasias, it may be said that they rarely occur alone. They are most likely parts of an extensive lesion, and consequently accompanied with much diminution of intelligence and confusion of thought (Kussmaul). Again, improvement may occur so as materially to change the decision in a given case, at a subsequent examination. They may also lead to questions of competency to pursue a given occupation—a physician, for instance, afflicted with paraphasia verbalis or paraphagia may write a prescription for the wrong medicine or dose.

21. **Anomia** proper (name-loss) has yet to be located as a pathologic entity.

22. **Name-forgetfulness** (**Paranomia**).—As already explained, the case reported by Mills as evidence of the existence of a special naming center in the left third temporal convolution seems to belong to the group of paraphasias (non-recollection of names) rather than to name absence.

Partial aphasia with preservation of a wide range of legal capacity is illustrated by a case of the writer's, of which the following is an abstract<sup>1</sup>:

Man aged sixty-nine, Irish, married, scroll sawyer. October 11, 1898, "Restless" during night. October 12th, semicomatose, with right hemiplegia, face, arm,

<sup>1</sup> For original report vide: Langdon, F. W., *Paranomia, Visual and Myotactic, Non-recollection Aphasia for names of objects seen and felt*, Philadelphia Med. Jour., March 4, 1899. (A clinical demonstration before the Academy of Medicine of Cincinnati, Nov. 28, 1898, from stenographer's report.)

and leg. Right pupil larger. No albuminuria. Loss of sphincter control for nine days. Bedridden. Temperature 98° F.; pulse 60 slow tension. Gradual improvement for twenty-five days, when sphincters were good. Right facial palsy almost recovered; good use of right arm and leg, with some inco-ordination of movement of right hand, and loss of feeling to touch, pain, and temperature extending about half-way up the forearm (*not "segmental" in type*).

Grasping power: Right hand, 26; left hand, 55 (Matthieu dynamometer). Normal estimated about 80. Eyes examined by Dr. Victor Ray, who reported, "Complete right lateral hemianopsia (blindness in right half of visual field). Slight swelling of both disks, physiologic cups absent; vessels contracted in both eyes; slight atrophic changes in *left eye only*."

November 20th, up and about ward daily. November 28th, walks fairly well; some ataxia right arm and leg. Good general intelligence for ordinary conversation.

Examined before the Academy of Medicine (stenographer's report):

Directing your attention to his speech functions, I will ask him some questions to test his receptive, constructive, and emissive speech mechanisms.

Q. What is your name?

A. Richard Fitzgerald.

Q. Can you spell Richard?

A. R-i-c-h-a-r-d.

Q. Can you spell John?

A. J-o-h-n.

Q. What is your business?

A. Scroll-sawing.

Q. What is this (indicating a chair)?

A. This is—well, I can't tell. (Non-recollection of *name* of object seen and understood as to uses.)

Q. Say "John went to market."

A. John went to market.

Q. What do people go to market for?

A. Sometimes for one thing, sometimes for another.

Q. Tell us some of the things.

A. Sometimes they go to get apples and sometimes for other things.

We note that he can hear and understand words and questions and can form replies correctly. There is no aphasia in either an auditory or motor sense. Suppose we test his *visual* speech-area.

Q. What is that (holding up a piece of chalk)?

A. It is what we call—I guess I am a little off.

Q. What is it used for?

A. It is used for writing purposes.

Q. What is that (showing a spoon)?

A. I will have to stop and think, you know; I have nothing to go by.

Q. If I were to name it, would you know?

A. Yes, sir.

Q. Is it a shoe?

A. No.

Q. Is it a knife?

A. No.

Q. Is it a spoon?

A. No, it is not a spoon.

Q. Is it a pencil?

A. I do not see any pencil about it. Now let me see, I believe it *is* a spoon.

Now, a man may remember and not *recollect*. Commonly we use the terms as synonymous, but a man may have a perfect memory and no *recollection*, as we may show in this case.

Q. Do you know what this is (showing spoon again)?

A. Yes; I know what it is, but I cannot call it.

You notice he cannot *recollect* the name, which he remembered when I told it to him. He has the object-recognition (memory) and word-construction areas intact, but between the reception of the *visual impression* and the forming of a name there is a break. He cannot *recollect* the visual impression at the word-forming area. Between word-hearing and object-vision, however, the connection is good, as shown by his recognition of the '*spoken* name.' This is important because it excludes practically a cortical lesion. This is not a case of *object-blindness* because the patient sees objects and knows what they are used for. He remembers the objects we show him, yet when he wants to *transmit* that memory to the word-planning area or

word-utterance area, and recollect that sensory impression or memory into words his power of transmission or *recollection* is gone. We know the break is not in the word-planning or word-utterance area or in the visual area for objects, or in the word-hearing area, because all these act normally. Whether he would recognize objects by hearing the sounds they make remains to be tested.

Q. What is that you hear (ringing a bell *out of patient's sight*)?

A. That is a bell.

He would recognize the bark of a dog, but could not call the dog by name if it were to run along the floor without barking. In other words, he *recognizes* by sound but not by sight, although he can see.

Q. What is this (showing bell, being careful not to let it make a sound)?

A. I do not know.

Q. Is it a knife?

A. No, sir.

Q. Is it a shoe?

A. No, sir.

Q. Is it a bell?

A. No—or, let me see, I said it was not a bell; I do not mean that. I think it is a bell.

Here we see a demonstration of an unbroken communication between the word-hearing and object-vision cortical areas.

A form of aphasia not uncommon is alexia, the inability to recognize letters and words. We know that this man is intelligent. Suppose we test his word-vision area.

Q. What is this (sheet of paper with the word OHIO in printed letters nearly an inch in height)?

A. Now, I cannot say.

Q. Is it a piece of paper?

A. Yes, sir.

Q. Is there anything on it?

A. There is some kind of writing.

Q. Can you recollect any of the letters?

A. Yes, here is "H."

Q. How old were you when you left Ireland?

A. I was only a boy.

Q. Can you recognize any letters on this side of the paper (the side containing the word VALLEY in large type)?

A. Yes, sir.

Q. Are they figures or letters?

A. They are letters. There is "H."

You will observe that there is no "H" on this side of the paper. He has *aliterarum*, or non-recognition of letters *seen*; also alexia, or non-recognition of words *seen*. I think from the study of the case in other respects that the *aliterarum* and alexia are not cortical. If they were, there would be an exceedingly limited cortical lesion in the angular gyrus. The reason I do not think they are cortical is the already practically proved fact that the cortical area for object-vision memories is intact; he simply cannot *recollect* these memories at the word-forming area. However, he has a form of alexia, probably a *subcortical* alexia. We may test this by asking him the *shape* of letters and words, so as to judge whether the cortical images (memories) are present.

Q. What shape is "O"?

A. It is round.

Q. What shape is "B"?

A. Makes an outline of B in the air with finger.

Other tests show that he has cortical images (memories) of words. He can describe them by their length, by their number of letters and their number of syllables, and by their meanings and definitions.

NOTE.—Subsequent tests show that he also remembers the shape and significance of figures, can add, subtract, multiply and divide correctly, *mentally* and *orally*, but *cannot name any figures at sight alone*.

It is evident that the patient has cortical memories of the shapes of letters and words, and that these are in connection with the *auditory* area, but *not* with the *visual* tract. Here we see that he has alexia without apraxia (object-blindness). This suggests different paths and centers for the two functions, and, even though they may closely adjoin each other, one may be damaged without the other, as we see in this case.

In gathering together the visual impulses of objects that have made their normal





Q. Are they moving (moving fingers)?

A. Yes.

Q. Can you see this (spoon in left visual field)?

A. Yes.

Q. Can you see it now (spoon in right visual field)?

A. No.

It is evident to you all, even from this rough test, that there is a right hemianopsia.

Q. Do you feel me touch you (touching right arm, forearm, and hand in succession)?

A. Yes.

Q. Where?

A. On the *arm*.

The patient has tactile anesthesia over the right hand and forearm. There is also loss of temperature-sense and defect (diminution) of pain-sense.

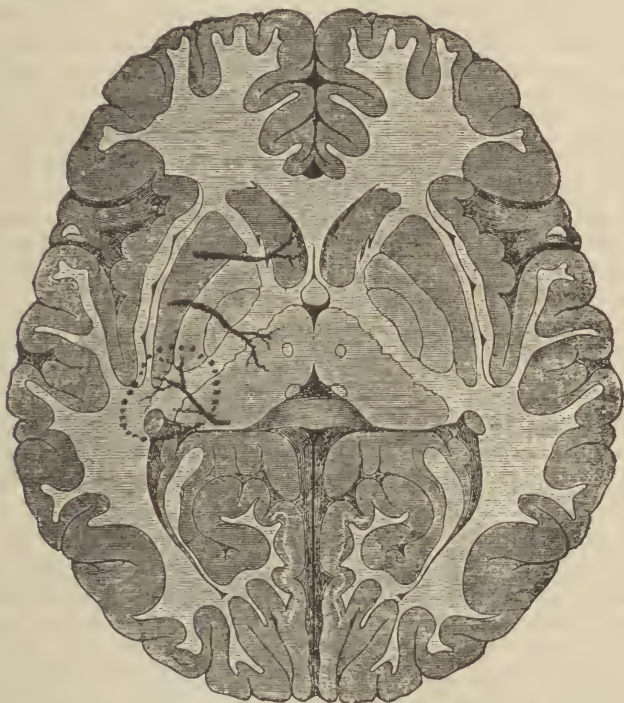


FIG. 177.—Horizontal section through internal capsule and basal ganglia of brain. Dotted area shows probable extent of thrombotic softening in distribution of external thalamic artery. (Diagrammatic—not verified—no autopsy.)

Q. Do you call your family by their names when they come to see you?

A. Yes.

Q. What is your wife's name?

A. Her name is Margaret.

Q. What is that (hands patient a spoon; patient's eyes closed)?

A. I know what it is, *but cannot call its name*.

Q. What is it good for?

A. (Goes through the motion of eating.)

By this latter test we see that he recognized a spoon by touch (muscle-sense) and understands its uses. He therefore has no myotactic (muscle-sense) aphasia, but he cannot recollect the touch-impressions and make for them a name; he has a break therefore between the muscle-sense area for objects, and the motor speech-

area—in other words, a *myotactic paronomia* or non-recollection-aphasia for names of muscle-sense impressions. (See Fig. 176.)

Q. You were always a good-natured man, were you not?

A. Yes, sir.

Q. What would you say if a man came at you in this way (assuming a pugilistic attitude)?

A. What would I say? I would put my pins up (exhibiting his fists in a similar manner).

You observe that he understands and responds to the language of pantomime. This indicates, of course, one of two conditions, namely: (1) some of the entering visual fibers to mimicry-speech-area of the left cortex have escaped damage; or (2) mimic language is bilaterally represented in the brain, and the patient is using his right hemisphere. The latter seems the more probable in this case.

The case is of interest also on account of the collateral symptoms, which indicate the capsular and subcortical situation of the lesion, and the escape of the cortex itself. The man's intelligence and association-powers in general are good, notwithstanding the fact that he occasionally gives a queer answer. From a medicolegal standpoint, while he would not be able to read a contract, if it were *read to him* he would understand it. These are matters not only of theoretic and scientific importance, but of practical bearing. If a man acts queerly, has the use of his limbs, and gives occasionally a queer answer to a question, some witnesses might think him insane, whereas this man is as sane as any one in this house, entirely competent to assent legally to contracts, dictate a will and transact such business as does not require him to read or write or name objects at sight; but the connection between areas whereby he can *recollect* a sensory (visual or tactile) impulse into a motor impulse are damaged. If someone will do the *recollecting* for him, he can do the rest. There is but one place where all the symptoms could be caused by a single lesion, and the nature of the case would not suggest that we have more than one lesion to account for the symptoms. The diagram (Fig. 176) shows the presumed location of the *lesion* in the posterior limb of the left internal capsule, and extending to subcortex.

To sum up the types of aphasia presented by our patient, we have: (1) Paronomia of visual type—or inability to recollect into words the *names* of objects *seen* and recognized and remembered. (2) Paronomia of muscular-sense type, or inability to *recollect* into words the *names* of objects *felt* and recognized and remembered; (3) alexia and aliterarum, or word-blindness and letter-blindness, subcortical in origin, as shown by preservation of cortical (mental) images of letters and words; (4) agraphia of executive or motor type purely—due to ataxia of right hand, not to any difficulty in psychic word construction. The patient can write legibly with his left hand, though awkwardly.

As to the location of the lesion, it appears extremely probable that the cortex has escaped serious damage. The symptoms—right hemiplegia, anesthesia of the right hand and forearm, right hemianopsia, alexia and non-recollection-aphasia, *without loss* of word-memories or object-memories—all point to a lesion involving the posterior limb of the left internal capsule and extending outward into the centrum ovale, but not reaching to the cortex. Such a lesion would involve the sensory portion of the internal capsule directly—the motor portion indirectly (by pressure); also the optic radiations of Gratiolet—to the occipital cortex and the receptive tracts to the angular gyrus. (See Fig. 177.) The extension outward into the subcortical area would necessarily destroy more or less of the connection-tracts between the (visual and motor) speech-areas; also between the stereognostic (muscle-sense) and motor speech-areas. The diagram (Fig. 176) shows the location of such a lesion.

As regards the *nature* of the lesion, the age of the patient, the presence of vascular disease elsewhere, the onset during sleep, implying low blood-pressure, the improvement in the motor paralysis, and the situation of the lesion, are all strongly suggestive of thrombotic softening. A mitral bruit which is present might suggest embolism—an event, however, that is most unlikely to occur in the vessel here involved (external thalamic). Hemorrhage is possible, but the absence of vomiting, of Cheyne-Stokes respiration, of prolonged albuminuria and of deep coma at any time, tend to exclude this diagnosis, as would also the absence of any cause of heightened blood-pressure at the time of onset.

**Additional Comment and Summary.**—Anomia—absence of names—would be a proper designation for *loss of name-memories*, *i. e.*, *non-recognition of names* of objects heard, seen, felt, smelled, or tasted.



Its existence would depend on destruction or abolition of function in a hypothetic "naming-center" or its entering "axons." Such a center or area has been suggested by Brodbent<sup>1</sup> and described by Mills and McConnell.<sup>2</sup> The latter report a case with a lesion in the third temporal gyrus and subcortex in support of their view. The patient, however, *recognized the names* when spoken; hence name-memories must have been present, as in the case here presented. It is also noteworthy that this case presented right hemianopsia, and hemiplegia later. It is evident that the patient that I have presented has not *anomia*, for he also recognizes names when spoken. There is nothing in either case, however,, incompatible with the existence of a true "naming-center" as postulated and located by Mills, for the same lesion that destroys the connections between the visual memory and motor speech-areas, would also be likely to involve fibers going to the supposed "naming-center" of Mills in the third temporal gyrus. While, therefore, the existence of a special "naming-center" or area may be conceded as possible, it must still be considered as "not proven."

It is evident that in our case the lesion is not *in*, but "away from" or "about" the speech-memory areas; hence it belongs in the group of *paraphasias* called "conduction-aphasias," by Lichtheim and Wernicke; "commissural," by Bastian; "interpictorial," by Wyllie, etc. I would suggest *non-recollection-aphasia* as a suitable clinical name for the whole group of paraphasias. *Paranomia* would seem a proper designation for the case here presented, as well as for that described by Mills and McConnell already cited; and for the form called "optic aphasia" by Freund,<sup>3</sup> which appears of similar character. It may be characterized as an inability to *recollect sensory images* into *motor names*. It is, therefore, one of the varieties of paraphasia or non-recollection-aphasia. In accordance with the sensory impressions received we may have: (1) Auditory paranomia; (2) visual paranomia (as in this case); (3) myotactic (muscle-sense) paranomia (as in this case); (4) olfactory paranomia; gustatory paranomia. Memory may exist and recollection be absent in all these forms. The lesion affects connecting tracts (axons, collaterals, dendrons), which are intermediate between the sensory (receptive) and the motor (emissive) areas.

In the autumn 1898 number of *Brain* (p. 343) a similar case as regards inability to name objects, with preservation of auditory and motor speech, is reported by Dr. Byrom Bramwell. This patient was adjudged capable of making his will, and did so to the entire satisfaction of his physician and attorney.

The autopsy revealed acute softening of Broca's convolution and anterior end of the insula, with some of the subinsular white matter; thus probably involving axons passing from the visual speech-area to the word-forming (Broca's) area. In this latter respect it is comparable

<sup>1</sup> Cerebral Mechanisms of Speech and Thought, Medico-Chirurgical Transactions, iv, 1872.

<sup>2</sup> The Naming-center: Journal Nervous and Mental Disease, 1895, xx, i; also A Text-book of Nervous Diseases, edited by F. X. Dercum, 1895, pp. 428, 434.

<sup>3</sup> Osler, Principles and Practice of Medicine, 1898, p. 1045.

with the case here reported, though very dissimilar in other respects. There was no hemianopsia.

**The Emissive or Motor Aphasias.**—These, the first recognized and best known of all the language defects, are also of greatest practical importance in a legal sense, since in the vast majority of persons, probably, the *construction* of a word in psychomotor sense usually, if not always, precedes its spoken or graphic utterance; probably, also, in many cases its pantomimic utterance. While it is claimed by some<sup>1</sup> that pantomime is the original elementary form of speech, the fact remains that in civilized man spoken speech has supplanted it to such a degree as to cause a natural devolution of pantomime by disuse.

While, as above stated, the motor aphasic is also usually agraphic, he is not invariably so. The exceptions are generally believed to be due to the subcortical location of the lesion; hence the actual word-planning area (Fig. 174, *M*, third frontal convolution) is not destroyed, but has lost its power of emission to the lower motor mechanisms. It may still be in communication with the graphic center (second frontal, Fig. 174, *G*); hence the power of writing may be intact for practical purposes.

Still another, and perhaps better, reason for the retention of graphic expression after loss of motor speech lies in the probable subdivision of the motor-speech processes into two distinct areas—namely, psychomotor and executive motor, as indicated in our scheme of aphasias on p. 454.

Cases cited by Broadbent and Mills<sup>2</sup> appear to warrant this separation on clinicopathologic ground. Wyllie<sup>3</sup> also alludes to this separation of functional areas as a possibility, and reports a case bearing on this interpretation, but without autopsy.

A case of the writer's furnishing strong additional evidence of separateness of these two functions of word-construction and word-utterance is here added:

J. B., colored, aged fifty-five, a tobacco warehouse porter by occupation, was admitted to my service at the Cincinnati Hospital on January 6, 1896. Power was good and equal in arms and legs. Jaw-jerk and double elbow-jerks present, with slightly increased knee-jerks. No pain or tenderness. Heart and urine normal. On arrival he was conscious, but mentally confused and gave irrelevant answers to questions, usually answering all questions with "yessir" (paraphasia verbalis). He seemed to understand what was wanted, and was apparently much annoyed by his wrong answers, especially when asked his name, which he was totally unable to give until prompted. Asked if it was "John Smith" or other erroneous name, he would shake his head negatively; on pronouncing "Jackson Butler," however, he at once brightened and assented vigorously; and with some difficulty and slowness said "Jackson Butler." Once said, he repeated it over and over frequently, seeming to fear to lose it. Words received were evidently understood; common objects were correctly pointed out and their uses comprehended, though their names could not be pronounced voluntarily; but words pronounced to him could be repeated immediately in the case of some words.

A notable exception to this last statement was the word "no." On being asked to say "no," he seemed to make a severe mental effort, and finally said, "I

<sup>1</sup> Vossius, Kleinpaul, quoted by Bateman, op. cit., 170, 171.

<sup>2</sup> Mills, *Aphasia and the Cortical Mechanism of Speech; A Text-book on Nervous Disease* by American Authors, Dercum, Phila., 1895, p. 434.

<sup>3</sup> *The Disorders of Speech*, 1894, pp. 317, 318.

can't say 'no.''' Gowers<sup>1</sup> records an instance identical with this in a case of motor aphasia. This was after he had been in the hospital for two days and had increased his vocabulary in several directions.

Unfortunately, his writing could not be tested on account of his lack of education in that direction, but he could make printed letters—A, B, X, etc.—from a copy; could pick them out of a group, but could not write them at command, and seemed fairly intelligent for his calling and station in life.

*Diagnosis.*—Cerebral thrombosis involving third frontal convolution.

In a month he was discharged practically well, so far as his conversational needs were concerned, but could not pronounce words like "Constantinople," "Generalissimo," etc.

He returned to his occupation, at which he worked successfully for seven months, when he was readmitted to the medical ward of the hospital for an attack of "diarrhea." On admission his pulse was 96. Temperature, 97.6° F. Respiration, 16. Urine contained albumin and sugar. Thirteen days later he was reported "improving"; and while sitting at the breakfast table, suddenly fell to the floor unconscious, with right hemiplegia (face, arm, and leg). Temperature, 98.4° F. Pulse, 80. Respiration, 24. Pupils dilated, irresponsive; conjugate deviation eyes to left. No vomiting; no convulsions. Transferred to neurologic service. Four days later he seemed to recognize and follow movements of objects with eyes and head; was mentally brighter, but did not recognize his spoken name; could hear sounds.

*Diagnosis.*—Cerebral thrombosis of left middle cerebral artery involving branches to motor speech and auditory speech areas, with the central motor convolutions. He gradually sank, and died on the thirteenth day after his stroke.

Autopsy by my colleague, Dr. J. H. Landis, September 16, 1896.

The foot of the left third frontal convolution (Fig. 174, *M*) (word-planning area of Broadbent and Wyllie) was occupied by a cyst the size of a small cherry, containing a whitish, diffuent material. The branch of the Sylvian artery leading to it was obliterated (inferior external frontal). This lesion was evidently the cause of the first attack of motor aphasia nine months before, and explains the presence of pure voluntary motor aphasia (word-construction-loss), with retention of the power of repeating words to dictation at that time by means of the "word-utterance" area (of Broadbent and others) in the foot of the central convolutions.

The second attack of complete auditory and motor aphasia with hemiplegia was explained by an extensive recent (red) necrotic softening involving the left central and first temporal convolutions, the insula, and the striate body. The larger blood-vessels throughout the brain were the seat of extensive arteriosclerosis and atheromatous patches.

Motor aphasia, as shown by the first attack in the foregoing case, is capable of improvement: even of apparently complete recovery in some cases. This improvement is due to two factors—viz., (1) recovery from pressure of an undestroyed portion of the third left frontal convolution. (2) Subsequent education of the right third frontal, previously dormant. In children this latter mode of recovery is often so complete that in after-life no language loss is observable.

Taking up seriatim the various types of motor aphasia indicated in our table we have:

**23. Psychic Motor Aphasia or Spoken-word-construction-loss (Loss of Word-plans or Psychic Spoken Memories).**—This, as shown by the preceding case and others recorded, has probably a distinct existence as a separate form.

The lesion, as just cited, is situated in the "foot" of the left third frontal (Broca's) convolution (Fig. 174, *M*, anterior half of shaded portion; also Fig. 178, 23).

The cause is most commonly a vascular occlusion (embolism, throm-

<sup>1</sup> Manual of Diseases of the Nervous System, 1893, p. 113.



bosis), hemorrhage, or traumatism. The effect on the patient is a loss of the power to frame ideas into words. The ideas, made up of sensory receptive combinations, exist, but the vehicles for their arrangement for expression are absent (see Fig. 178, spoken-word plan).

As already stated, the motor aphasic is usually also agraphic, if the lesion is in the word-planning area of Broca's convolution, as it commonly is.

(a) Should the lesion be limited to the word-utterance portion of the motor area (see Fig. 172, central convolutions), it seems quite possible that word-planning may still exist and that the plans may be transmitted to the psychographic center and thence to the motor-graphic area for emission as written speech.

(b) Should the lesion, however, destroy the word-planning area itself, nothing remains with which to express his ideas but pantomime

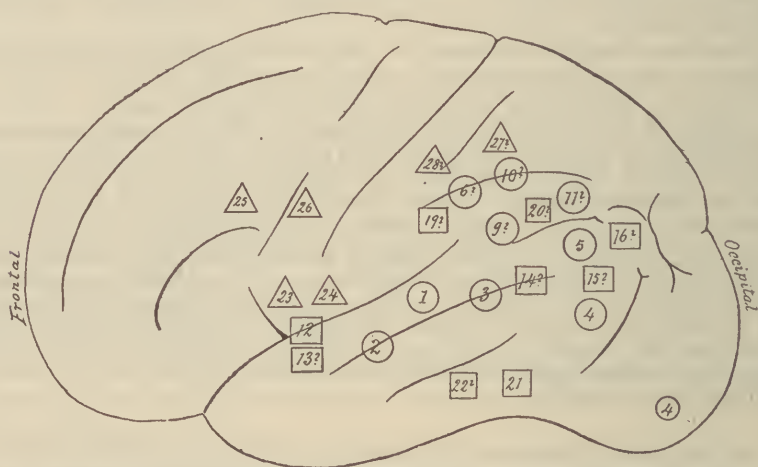


FIG. 178.—Left hemisphere of cerebrum, outer surface; localization of aphasias: ○ receptive; □ intermediate; △ emissive; doubtful or unverified marked ?. Numbers correspond with table, page 449 (Brain outline modified from Wilder).

pure and simple. Pantomime probably does not primarily express words, but the ideas which precede word-planning and word-utterance; in this sense it is more elementary than spoken speech, as is also evident from its extensive use by infants and savages.

Testamentary capacity is evidently not abolished by either of the two conditions just mentioned, since in the first writing and pantomime and in the second pantomime expression would remain. In both the receptive sensory areas and their intercommunication are intact, so that ideas based on them are correctly formed.

Simple business acts, such as required only the expression of assent and dissent, would be also valid in such a case, for similar reasons. The main questions to be settled are: (1) Does the patient comprehend the nature and relations of the proposed act? (2) Can he express assent and dissent with certainty? Numerous cases of motor aphasia possess-

ing important legal relations are on record, of which the following, cited by Bateman (*op. cit.*, 301 *et seq.*), may be here referred to:

"As far back as 1743, long before the attention of the profession had been directed to the subject of aphasia, a resident of Munden, who was deprived of the power of speech, applied to the Hanoverian government for permission to make a will in favor of his wife by means of signs; and the Court acknowledged the validity of the act."<sup>1</sup>

The fact of the will in this case having been made by means of *signs* (pantomime) is susceptible of one of two interpretations: (1) That the testator had never learned to write; (2) that the aphasia was due to destruction of the written-word-planning area, and consequently was accompanied by *agraphia*.

24. **Executive motor aphasia, word-utterance-loss**, without loss of word-planning capacity, may be due to a lesion in either of two loca-

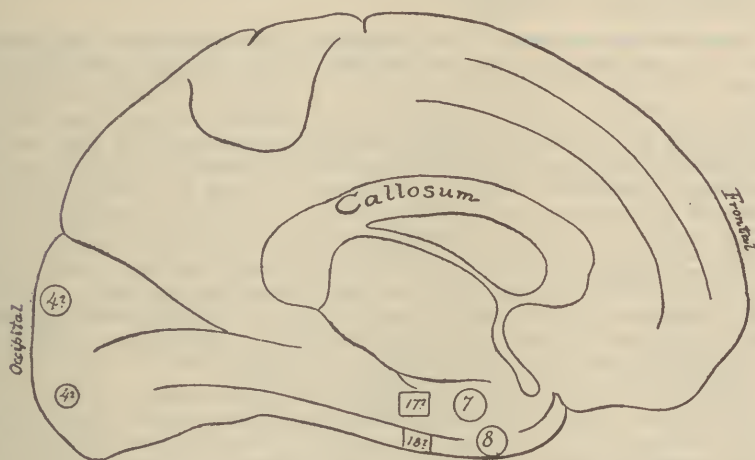


FIG. 179.—Left hemisphere of cerebrum, inner surface; localizations as on preceding figure (Brain outline modified from Wilder).

tions: (1) A cortical lesion, situated at the "foot" of the ascending frontal (precentral) gyrus, immediately adjoining the foot of "Broca's" convolution proper. (2) To a subcortical lesion blocking the motor emissive tract on its way to the bulbar nuclei. Simple word-utterance aphasia is obviously of less importance in every way than the preceding form (word-construction or planning). The liability of the lesion also to damage the immediately underlying *insula*, however, and thus cause a *paraphasia verbalis*, must be borne in mind. Even then graphic and pantomime utterance would probably remain and would be sufficient for will-making and the transaction of uncomplicated business. In other words, the subject of simple word-utterance aphasia can receive, understand, and convey assent or dissent, by writing and pantomime, to propositions put before him by spoken, written, or mimic language.

<sup>1</sup> Hofbauer, *Traite de Medecine Legale*, Paris, 1827.

An aphasic discharged, during a period of five years, the functions of Mayor and of Municipal Councillor, by simply writing his name to the necessary documents, which he had learned to do with his left hand. He also, with his *left* hand, wrote, at intervals, a holographic will, perfectly correct in every respect; the validity of this document was recognized by the law court.<sup>1</sup>

This case would appear to be one of lesion of the word-utterance area, involving also the graphic connections or their subcortical emissive fibers of the left hemisphere; the word-planning area being intact and its productions transmitted to the *right* hemisphere (graphic area), whence they secured outlet through the ordinary channels to the left arm and hand.

Another case, illustrative of the combination of motor aphasia and agraphia, with hemiplegia, as well as of the importance of small details in a legal sense, is as follows:

"The testator, the Rev. J. T. L., a widower, sixty-three years of age, was engaged to be married, when he was suddenly seized with right hemiplegia and aphasia. Although unable either to speak or to write, he could make himself understood by those around him by signs; and by the language of gesture he succeeded in conveying to his medical attendants that he desired to make a testamentary disposition in favor of Miss R., whom he had intended to make his wife. A card was procured, and upon it, by the direction of the testator, the following words were written: '£30,000 to Miss R., to be tied up to her for life, and after death to come back to my family, and be divided fairly and equally.' This document was written by one of the medical attendants; the testator then made a mark, not at the bottom, but in the middle, of the card, through the word 'life'; one of the doctors then wrote diagonally from this mark toward the right-hand upper corner of the card, the words 'Mr. L's mark,' and they both attested the execution of the document by placing their initials on the back of the card, with the words 'Witness to mark,' and followed by the date, November 20, 1885. Evidence was produced to prove that he showed this card to the lady whom he had intended to benefit, telling her that it was for her, and that he wished her to keep it.

"The mode in which the testator communicated his wishes was as follows: He made signs for writing materials; his wishes were interpreted by means of signs, and then written down on the card. He held up his hand, extended his five fingers, and was asked if he meant 'thousands'; he bowed assent. He then closed his hand, and opened it in the same way, implying ten; this operation was repeated until it amounted to thirty, and then dropped his arm down. Testator was then asked whether he wished Miss R. to have thirty thousand pounds, and he nodded his head.

"In order that there might be no mistakes about his wishes as to details, he was asked whether Miss R. was to have this sum absolutely; he signified dissent, but on being asked if it was to be hers for life and afterward revert to his family, he bowed his head."<sup>2</sup>

Bateman's comments on this case are: "It will be observed that the nature of the testator's wishes was ascertained principally by putting questions, by which he signified approval or dissent by nodding or shaking his head as he lay in bed. . . . From a consideration of the foregoing facts it seems clear that the witnesses did correctly interpret the meaning of the testator's signs, which evidently expressed his testamentary wishes; his gestures answered to rational conceptions, and were therefore external, but not oral, manifestations of the *verbum mentale*; and this view was taken by the president of the court, who held that

<sup>1</sup> Billod, *Annales Medico-psychologiques*, tome xviii, quoted by Bateman, 302.

<sup>2</sup> Law Reports, Probate Division, 1867, xii, 8 (England).



the writing on the card constituted a valid testamentary document; that the writing of the witnesses on the back of the card was also a sufficient attestation, and that the will would have been allowed to stand *if the testator mark had been placed at the bottom or foot of the card*<sup>1</sup>; but as the mark was made in the middle of the card, its position was not such as to satisfy the provisions of the Statute of the Wills Act (iv, Vic., Chap. xxvi, Sec. 9) or of Lord St. Leonard's Act (xv, Vic., Chap. xxiv, Sec. 1), and the instrument was not duly executed, and consequently not entitled to probate, which was accordingly refused."

It is hardly necessary to remark that the defect in the document was not due to the speech defect, but to a simple error of legal technic.

One more case, evidently of damage to the spoken-word-utterance and written-word-planning areas, and bearing on the question of capacity to manage ordinary business affairs, is the following: As Bateman remarks: "It is all the more interesting as it formed the subject of a formal discussion in a scientific body, perhaps the most competent in Europe to deal with this question—La Societe de Medecine Legale de Paris."

"A merchant, aged sixty-two, having acquired a fortune in his business, was attacked with right hemiplegia and complete aphasia. After some months of treatment, including a season at the baths of Balaruc, he improved so as to be able to walk, although imperfectly; the arm, however, continued quite paralyzed, and the aphasia persisted. Later on the paralysis in the arm yielded somewhat, but the power of speech was limited to the sounds O, o, a, qui. Whatever was said to him he replied by these same syllables; but he was able to make himself understood by articulating these words with different intonations, accompanied by very expressive signs executed by the head or by the left hand. His wife, more accustomed than any others to his language, interpreted what he wished to say; and if she happened to convey a wrong notion of what he desired to say, he showed great irritation, and endeavored to make himself better understood by more expressive gestures. As his right hand was paralyzed, he had learned to write with the left hand; but if left to himself, *he could not write spontaneously without copying*—he required a model under his eyes, and could only recopy what was written and set before him.

"In order to test the degree to which he had retained his intelligence it was pointed out to him that it would be to his advantage to collect his rents every month, instead of allowing them to accumulate for six months; he indicated very clearly that he understood this advice, and that he entirely approved it, and he informed his wife that for the future he wished his rents to be collected in the manner advised.

"It was evident that, in spite of his speechlessness, he had in great measure retained his intelligence and his power of volition, and he knew perfectly well the state of his affairs. He frequented places of public resort, and would pay for what he ordered without making any mistake; he was in the habit of seating himself near those who were playing at cards, and he would intimate his approval or disapproval of their playing, and even venture upon advice by means of signs, which testified to the preservation of his intelligence."<sup>2</sup> The relatives of this gentleman had demanded what the French Law calls an "interdiction," and after a prolonged discussion, the Societe de Medecine Legale decided that his condition did not justify his being deprived of his civil rights; and the tribunal at Avignon, to which the case was subsequently submitted, gave a decision in conformity with the views of the "Legal Medical Society."

Bateman's comments in this case are: "There cannot be a doubt about the propriety of the above decision. This gentleman was the

<sup>1</sup> Italics by compiler.

<sup>2</sup> Annales d'hygiene Publique et de Medecine Legale, tome xxxi, p. 430.

subject of motor aphasia; he was unable to express himself by articulate language, but he possessed to an eminent degree the language of signs. It will be observed that he was also the subject of agraphia, for although he could copy, he was unable to give spontaneous expression to his wishes by written language; he could originate nothing in writing: if his model were withdrawn, he was incapable of writing a single letter."

Hence his aphasia was of two distinct types, according to the scheme here adopted—viz., (24) executive motor aphasia and (25) psychic agraphia, implying lesions respectively of the foot of the ascending frontal (pre-Rolandic) and of the second frontal convolutions or of their subcortical communications.

Diller<sup>1</sup> has recorded 2 cases of motor aphasia, probably of the executive form, with legal bearings as follows:

A retired physician, aged sixty, had an attack of right hemiplegia with aphasia; he recovered and transacted important business affairs for some years. His will was contested on the ground of incompetency, as having been made after his paralytic attack. During the trial a second will, made some years *before* his aphasia, was produced, which agreed so well with the disputed one that the legal proceedings were terminated.

The second case, a lady aged sixty-five, also had right hemiplegia with incomplete motor aphasia. The doctor believed that she was incompetent to enter into civil contracts or to receive and pay out money constantly as her business required, but that she was able to give intelligent assent or dissent to any single business propositions and to give a power of attorney to her children.

**25. Psychic Agraphia (Written-word-construction-loss).**—The existence of actual proof of this type has been questioned.<sup>2</sup> Since that date, however, Eskridge<sup>3</sup> has put on record an undoubted case of this form where the patient, though unable to arrange letters into words, "wrote a good legible hand when the words were spelled for him." Operation and removal of a cyst from the foot of the left second frontal convolution much improved his power of spelling and voluntary writing. The legal bearings of psychic agraphia would be limited to the consideration of possible errors in written documents. In every other respect the purely agraphic are competent legally if sane.

**26. Executive Agraphia (Written-word-utterance-loss).**—This form in itself is of even less importance legally than the preceding. The lesion may be located either in the left arm and hand area immediately posterior to the second frontal convolution, or in the centrum ovale or internal capsule, thus impairing conduction to the spinal centers. In the latter case compensation would probably be established in some degree by way of the corpus callosum, so that intelligent writing could be effected by means of the motor centers of the opposite hemisphere.

**27. Psychic motor amimia or (28) executive amimia<sup>4</sup>** alone would be

<sup>1</sup> Journal of Nervous and Mental Disease, May, 1894, p. 293.

<sup>2</sup> Mills, Dercum, Text-book on Nervous Diseases by American Authors, Lea, Phila., 1895, p. 436.

<sup>3</sup> Medical News, Phila., August 1, 1896, p. 122.

<sup>4</sup> Grasset, Le Progres Medical, 1896, records a case of motor amimia in a congenital deaf-mute. The patient had lost the power of expression by the sign language with the right hand, but retained the use of the left for language purposes, see Jour. Amer. Med. Assoc., November 28, 1896, p. 1162.

of even less importance than the agraphias, and do not require consideration here.

**Irregular and Mixed Forms of Aphasia.**—It is important to bear in mind the possible, even probable, presence of “mixed” forms of aphasia in any given case, due to the fact that the same artery (middle cerebral) supplies, through its various branches, the auditory, visual, motor, graphic, and probable pantomimic cortical areas.

Occlusion of branches of this vessel are apt to give rise to a confusing association of the various forms of speech defect, as well as the extension of a given area of necrotic softening from time to time by occlusion of additional branches of the same trunk. Thus in the case of a man aged forty-one, a tailor by occupation, recently under the writer’s care, there appeared in succession, during a period of six months—

1. **Motor aphasia**, psychic and executive (involvement third frontal and precentral gyri).

2. **Paraphasia (insula)**—*i. e.*, patient replies to all questions with the one expression, “donesches” (gibberish aphasia).

3. **Paragraphia** (probably in this case subcortical in location), since with his left (unparalyzed) hand he made an attempt, partly successful, to write his own name, and could reproduce it so as to be recognized from a written copy.

4. **Auditory aphasia**, or word-deafness (first temporal), not recognizing eventually such words as hand, head, eye, though when he first came under observation he could pick out button, coat, pencil, in addition to parts of his own body, at command.

5. **Visual aphasia**, word-blindness at first and object-blindness later (angular gyrus). While at an early stage of his illness he could select his own written name from a group of others, he could at no time point out the individual letters composing it, nor put them together to form the name (aliterarum without complete alexia). Later he lost all recognition of written or printed words, his own name included. He could recognize the uses of some objects with which he was familiar, as shears (he was a tailor), and when given a dressing forceps and cloth with signs indicating that he was to cut the cloth, he smiled and pointed to the absence of cutting-edge on the forceps. Given a bottle and a cork together, however, he failed to connect them in any way; and much effort and uncertainty were manifested before he recognized the use of a watch-key.

6. **Paramimia**, due in part, at least, to the right hemiplegia which accompanied his aphasia. Facial and emotional expression were well preserved; smell blunted, and taste apparently almost absent, so far as could be determined. These defects left the patient on the receptive side, the muscular and tactile senses (uneducated for words in his case) with temperature sense and pantomimic appreciation. On the emissive side only emotional expression and pantomime remain, the latter impaired by the right arm palsy, though he looks intelligent and shows an earnest desire to express his wants. The constantly recurring utterance



of the expression "donesches" (gibberish aphasia), with a lively attempt at pantomime by the facial muscles and left arm and hand, with obscure vocal sounds, was all that remained of the language faculty. In addition, he could manifest emotional expression to a considerable degree, smiling when shown a comic picture unexpectedly. He does not seem to have full appreciation of his deplorable state, as shown by the absence of marked mental depression. The lesion in this case is probably vascular occlusion (thrombosis), gradually involving additional branches of the left middle cerebral artery. In every legal aspect, of course, the words incapacitated and irresponsible apply to this case.

Other "irregular" varieties of aphasia requiring separate consideration are those of temporary character. Those due to feebleness and exhausting illnesses have been already mentioned. Other forms are the epileptiform and hysteric. Bateman<sup>1</sup> cites an interesting case which he classifies as epileptiform, but which many would be inclined, from the history, to consider hysteric. "The salient features were total loss of speech of an intermittent character, lasting from a few hours to six weeks; the suspension of the faculty of articulate language always coinciding with pain at the nape of the neck, and its restoration being invariably accompanied by pain in the lumbar spine." "True hysteric" (or cortical functional) aphasia does occur, however, not including in this term the simple loss of voice so common in hysteric conditions; this latter is aphonia, but not aphasia.

An example of recurring attacks of functional cortical (hysteric) aphasia occurred in a patient of the writer's, a widow, forty-six years of age, who was passing along a crowded thoroughfare with a satchel containing several hundred dollars, the proceeds of the sale of her entire property. The satchel was snatched from her hand by a man who escaped with it. From that moment she was speechless—not simply voiceless, but appeared to lack the power of cerebral word-construction. She also manifested in a marked degree the emotional temperament, contracted visual fields, and other "stigmata" of the hysteric constitution. Under general nutritive and hygienic measures she recovered in a few weeks, but has had two recurrences from slight causes, both yielding to treatment in a few days. One of these attacks followed a fall with unconsciousness, according to her statement. The absolute speechlessness in the first attack prevented outcry and was the cause of her failure to secure assistance in stopping the thief. During these attacks, questions of legal competency might easily arise. Between the attacks, however, there can be no doubt of the patient's capacity to conduct ordinary affairs with average judgment for her station in life. She earns her living as a seamstress, and is in every way logical and proper in her conduct.

To sum up, it is apparent from the foregoing remarks on the genesis and nature of speech and its disorders that the interrelations of the individual with his environment, as regards language, depend on three factors: (1) Sensations received from without and recognized as percepts

<sup>1</sup> On Aphasia and the Localization of the Faculty of Speech, 1890, p. 136.

by the brain; (2) concepts or ideas formed by the brain from association and combination of these percepts; (3) motor expression of these concepts or ideas by spoken words, written words, pantomime, and by vocal sounds that are not words, as shrieks, exclamations, etc.

Disorders of either series of processes will impair language as a whole. The legal results of this impairment depend on its degree and nature and may be summarized as follows:

Sanity established, any legal document should be recognized, upon proof that the person uttering it could understand fully its nature, by any receptive channel—namely: hearing, vision, or muscle sense—and did also express assent or dissent with certainty to proper witnesses; whether this expression be by spoken, written, or pantomime language.

As regards responsibility and competency for acts other than signing a will or document, the form of language disorder present, and its relation with the nature of the act, must be carefully considered. In other words, cases of this latter class must be individualized rather than generalized.

# INEBRIETY

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THERE is little reason to doubt that the moderate enjoyment of alcohol is, to the average individual at least, not only not injurious, but, on the contrary, is often decidedly beneficial. On the other hand, the injudicious and immoderate indulgence in alcoholic beverages can never result in anything but mental and physical degeneration.

Inebriety produces such marked deviations from the normal character, intelligence, will, and reasoning powers that the inebriate, either when he is in the active stage of intoxication or when his brain is enfeebled and degenerated from long-continued alcoholic excesses, frequently perpetrates offenses, either against private persons or the state, which render him liable to legal prosecution. On the other hand, the impairment of the mental faculties of the inebriate greatly diminishes his power of resisting the machinations of the designing and unscrupulous, who, by taking advantage of his helplessness, may so jeopardize his interests that the intervention of the state may be necessary for the preservation of his rights.

Inebriety is not in itself a punishable offense against the state. It may be a moral wrong, but of this the state cannot take cognizance. It is only when the inebriate violates the rights of others or commits offenses against the public welfare that the law may hold him responsible, or, if it can be shown that in consequence of his inebriety he has become unable to protect his own interests, the state will step in and protect them for him.

The effect of alcohol upon the functions of the brain varies in different individuals, depending somewhat upon some peculiar idiosyncrasy and hereditary predisposition as well as upon mental and physical vigor. It can, therefore, be readily understood why some succumb to alcoholic excesses which seem to be borne by others with apparent impunity; but in reality alcoholic excesses, even to the most vigorous, are always injurious.

In order to arrive at a clear understanding of the legal responsibility of the inebriate it is essential to analyze the different forms of inebriety somewhat in detail. The inebriate's legal responsibility, except in tort cases, depends almost entirely upon his knowledge of the nature of the acts he commits and his ability to discriminate between right and wrong. It is only, therefore, when his mental condition in all forms of inebriety is studied and understood that a definite comprehension of his responsibility can be reached. All men are considered in law responsible for their acts until proved to be irresponsible. A distinction must be made



between moral and legal responsibility. An inebriate may be morally irresponsible and yet be held responsible in law. In many classes of torts such is the case. He may be absolutely unconscious of wrongdoing and is therefore morally irresponsible, and yet the law will hold him strictly to account. In other cases moral irresponsibility is a complete defense or else may be successfully urged in mitigation of punishment.

For the convenience of analysis inebriety may be divided into four distinct classes: The first class embraces those who are, as a rule, moderate in the use of alcohol, but who occasionally indulge in it to excess. In these cases the degree of moral responsibility of the inebriate depends upon the degree of his inebriety. In moderate quantities alcohol stimulates the mental faculties and engenders a feeling of satisfaction and well-being. This is not, of course, inebriety, and an individual in this condition is perfectly responsible for all the acts he commits. He may not, in his normal condition, be satisfied to uphold the opinions he expressed while stimulated, and he may even be obliged to admit that his actions savored of extravagance or recklessness, but the moral sense remains, and consciousness and memory are unimpaired. With further indulgence the conditions change. Stimulation of the mental faculties is succeeded by gradually diminishing intelligence, the moral sense is either perverted or partially abolished, and reckless acts of conduct which would shock his sense of propriety in his sober moments are by no means uncommon. The will and the reasoning faculties are both enfeebled. In this condition he can readily be persuaded to do things to the injury of himself or others which he would not in his sober moments dream of doing. He may perpetrate similar acts of his own volition. Many instances are on record in which individuals in the state of inebriety have been induced to issue notes, make wills, sign deeds to property, and even to commit crimes, or they may do all these things acting upon impulses generated in their disordered brains. Consciousness, in this stage of drunkenness, is in a very peculiar condition.

If enough alcohol is taken, insensibility will, of course, supervene. But before this point is reached the individual is certainly conscious, in that he is awake. He seems to have a conscious appreciation of his acts at the time he does them, and can often give his reasons for so doing, yet when he arrives at a state of sobriety he either has absolutely no recollection of anything that transpired during his period of inebriety or else his recollections are exceedingly vague and indistinct. In such a case consciousness is not abolished, but the memory of consciousness is. This form of inebriety is usually of brief duration, rarely lasting more than a number of hours. Occasionally, however, one of this class continues his excesses for several days, and brief periods of sobriety or partial sobriety alternate with longer periods of drunkenness. This condition may terminate in delirium tremens or acute alcoholic mania. Acts of violence, horrible in their ferocity and brutality, are apt to characterize this state. Murders are sometimes committed, usually accompanied by the most savage mutilations and often perpetrated with-

out the slightest provocation, but are generally the result of frightful hallucinations from which the maniac suffers. When the maniacal condition terminates—and it may do so with comparative suddenness—there is rarely any recollection of what transpired. If there is any at all, it is very indistinct.

For the purposes of this article the second class is made to include those who are extremely abstemious, but who, at certain periods, are seized with the most uncontrollable cravings for alcohol. This condition is known as *dipsomania*. The attack usually comes on suddenly, after a preliminary period of depression or of exhilaration, and lasts from a few days to a week or two. During this time the individual drinks immoderately. He is utterly oblivious to his surroundings and indifferent to the disgrace his conduct is likely to entail upon himself and his family. Refinement and morality are cast aside, and unbridled debauchery reigns instead. It is, perhaps, hardly proper to classify dipsomania as a form of inebriety. It is, more accurately speaking, a form of manic-depressive insanity, characterized, during the seizure, by an uncontrollable craving for alcohol. But the effect of the alcohol upon the brain is the same, no matter whether the debauchery is caused by an uncontrollable impulse or is the result of appetite or mere conviviality, and the dipsomaniac during the period of his debauch may commit acts which render him liable to civil or criminal prosecution. It is, therefore, necessary to discuss the inebriety of this form of insanity at the present time. Acute alcoholic delirium is not an infrequent sequel of dipsomania, and if it does occur, it differs in no respect from the delirium of the true inebriate. Acts of violence are often perpetrated of which no memory exists when the individual returns to his normal condition.

The third class, known as chronic alcoholism, includes those who habitually drink to excess. Daily and immoderate alcoholic indulgence in time leads to degenerative changes in the brain and its membranes. Manifold and progressive disorders of the mental faculties naturally follow, terminating, generally either in dementia or alcoholic insanity.

In the chronic inebriate the moral sense is blunted, he is indifferent to the necessities of those dependent upon him, and usually cannot be made to appreciate the disgrace which his conduct entails upon his friends and family. During his state of inebriety he is usually good-naturedly stupid. In his moments of sobriety he is irritable, peevish, or morose, which feelings he invariably seeks to relieve by recourse to alcoholic stimulation. The will-power is always weakened, and the mind can be readily influenced, thus rendering him an easy victim to those who would use him for their own purposes. The memory fails, at first for recent occurrences which do not impress themselves forcibly upon his mind, while the memory of events which transpired years before may be remembered with ordinary accuracy, but in time, as the cerebral degeneration advances, even these memories decline. The reasoning faculties fail also, so that often only the simplest questions can be logically determined.

Tremor is a constant symptom. It is most frequently observed in

the hands and arms, sometimes in the face, particularly during articulation. It is mainly to be seen during the periods of sobriety, and gradually decreases the more the alcoholic influence is felt. It is not at all uncommon for individuals of this class to drink enough every day to induce either a drunken stupor or else absolute insensibility by night. Acts of violence are rarely committed unless the inebriate is deprived of alcohol. In such a case delirium tremens or mania may follow the deprivation. It must not be concluded from this that all chronic inebriates are absolutely devoid of intelligence. Many of them, while not able to compete with the world in creative thought, can attend to routine work fairly well. Others are quite capable of managing their property to a limited degree, but it would be rare, indeed, for a chronic inebriate to exercise that shrewdness, foresight, prudence, caution, and intelligence which are essential in successful business ventures, investments, and the management of estates of any magnitude.

The fourth class includes those who suffer from chronic alcoholic insanity. This affection, springing, as it usually does, from chronic alcoholism, may be considered very properly as simply an advanced stage of that condition, and yet there is a dividing-line, not always sharply demarked, on one side of which there is mental deterioration alone, and, on the other, mental deterioration with well-marked insane delusions and hallucinations. In time the chronic inebriate becomes suspicious that his friends are treating him coldly, or that his wife is becoming indifferent to him. If he sees persons conversing together, he is apt to imagine that they are making derogatory remarks about him or else are weaving a plot to injure him. He becomes suspicious and apprehensive, and often begins to take such precautions as he may consider necessary for self-protection. Hallucinations, most always of a frightful nature, become common. He fears for his life, and often appeals to the authorities for protection. Failing to obtain adequate security or perhaps feeling that he must protect himself at all hazards, he commits some frightful act of atrocious assault or homicide. Delusions of persecution become well marked. He believes he is being poisoned, and often refuses to eat because of the fear that his food has been tampered with by his enemies.

Delusions of a sexual nature are characteristic of this form of insanity. The most common of these is the delusion of marital infidelity. The ordinary social relations of his wife with his male acquaintances are distorted, in his mind, to love trysts and assignations. Even incestuous accusations may be made. These delusions frequently lead to murder, which is usually perpetrated with great brutality and ferocity. Delusions in regard to his own sexual organs are not uncommon. He believes that his wife or her suspected paramour is about to mutilate him, or that others are attempting to accomplish the same end or to render him impotent by mesmeric influence or by secret drugs surreptitiously introduced into his food or drink. These delusions are not necessarily or even usually continuous. After they have passed they are not even remembered, or but imperfectly so. During these periods



he may express the most unqualified affection for his wife and esteem for his friends until the returning delusion disturbs his mind again. The memory, the will, and, in fact, all the mental faculties deteriorate more and more, until finally a condition of well-marked dementia is reached.

From a study of these different forms of inebriety the conclusion is obvious that the responsibility of the inebriate varies somewhat according to the class in which he belongs, and that the responsibility of different individuals in the same class depends to a great extent upon the degree of their inebriety. The inebriate is brought into relations with the law either because he has injured others or is about to do so, or because he needs protection or redress himself. These relations are most frequently brought about by his participation in contracts, the making of wills, and the perpetration of torts and crimes. Each of these divisions of law in connection with inebriety will be considered separately.

Occasionally before the national prohibition law became effective, and much more frequently since then, cases of wood alcohol poisoning have been reported from almost every section of the country. Methyl alcohol, or wood alcohol, as it is more commonly known, unlike ethyl alcohol, even in moderate quantities, is a most violent poison. The system cannot oxidize wood alcohol. While ethyl alcohol is split up into carbonic acid and water, methyl alcohol very slowly changes into formaldehyd and formic acid. Both of these substances, particularly the formaldehyd, are very poisonous. Probably all of the internal organs are, more or less, seriously injured by the drinking of wood alcohol, but the destructive effect on the nervous tissues is even more profound. Taken in moderate quantity the most pronounced symptom is partial or complete blindness. The pupils become dilated and react sluggishly to light. Papilledema is an early symptom. The optic nerves are white with blurred edges, and the blood-vessels are greatly contracted. The optic nerve atrophy is secondary to the choked disk. When larger quantities are taken there is, in addition to the symptoms just mentioned, headache, vomiting, often with blood, severe abdominal pains, dyspnea, cyanosis, convulsions, coma and death from respiratory paralysis.

From a legal standpoint, under the Volstead act, both the seller and the purchaser of a beverage containing more than  $\frac{1}{2}$  per cent. of alcohol, is guilty of a criminal offense. For medicinal purposes permits are issued both to purchase and to sell under certain restrictions, alcoholic liquors of full strength, but no permit is issued, under any circumstances, to either sell or buy methyl alcohol for internal medication.

There have been many instances in which persons, either ignorant of, or indifferent to the terrible results of taking wood alcohol as a beverage, have deliberately used it in the manufacture of a spurious whisky which has been indiscriminately sold to people who were ignorant of the fact that they were purchasing a deadly poison. In this way many people have been killed and many more made partly or completely

blind. It is, of course, a difficult matter to connect the guilty act with the guilty party. Where this can be done, however, there is no doubt that the guilty party could be convicted of murder in the first degree. Such a conviction has been obtained in a Montana court.

**The Inebriate and His Contracts.**—It is a well-settled point that the insane are liable generally on all contracts for necessities. This rule would perhaps hold good for all forms of inebriety. But in express contract it is very different. Any one entering into contractual relations with a man who is manifestly intoxicated must necessarily do so with a full knowledge of his condition. This in itself would raise a strong presumption of fraud. The same very properly might be said of one who enters into an express contract with a dipsomaniac during his period of debauchery. Such contracts, although not absolutely void, could be avoided unquestionably when the inebriate became sober. In such a case the contract must be rescinded at once and the thing contracted for returned if it has been received. But if the inebriate, during sobriety, ratifies the contract expressly or does so by retaining the benefits thereof, he, of course, becomes responsible for the performance of his part of the agreement.<sup>1</sup>

In implied contracts, such as for money paid or borrowed, necessities purchased, or goods sold, drunkenness is no defense.<sup>2</sup> The chronic inebriate and the sufferer from alcoholic insanity are both liable on implied contracts for necessities, which term is held to include those things which are useful and appropriate to their station in life. Involuntary entering into express contracts both may or may not be held responsible, according to the circumstances of each particular case. The chronic inebriate has his periods of sobriety, and although his mind may be enfeebled in many respects, he usually has ample intelligence for the transaction of business affairs, if not of too intricate a nature. In alcoholic insanity, particularly in the early stages, there are often times when the sufferer is free from hallucinations and delusions and may then be able to enter into contractual relations without exciting any suspicion of lunacy. Generally speaking, if the inebriate shows no evidence, to a person of ordinary prudence, of mental incapacity, and if the contract has been made in good faith and for a valuable consideration, and has been executed, it will be binding.<sup>3</sup> But where the contract has been entered into during profound intoxication or when the inebriate is actually insane, the contract is voidable. It may be ratified when the individual becomes sober or during his sane moments, or it may be set aside absolutely. If rescinded, the other party must be placed *in statu quo*. If the insane inebriate enters into a contract while he is in charge of a legally appointed committee, the contract will be void.

The defense of inebriety is often urged for those or by those who have signed commercial paper either as makers or indorsers. The mind

<sup>1</sup> *Carpenter vs. Rogers*, 61 Mich., 381.

<sup>2</sup> *Gore vs. Gibson*, 13 M. & W., 623.

<sup>3</sup> *Brodrib vs. Brodrib*, 56 Cal., 563.

of the inebriate, and particularly of the chronic inebriate, is often in so confused and chaotic a condition that he may fraudulently be induced to sign notes or other papers of value without having a clear understanding of the nature of his act. In fact, he may retain no memory of the transaction afterward. In such a case a note so signed may be canceled unless it has passed into the hands of an innocent third person for value, and then it will be enforced.<sup>1</sup> In a case of this kind a party plied the plaintiff with liquor until he became intoxicated, and then induced him to sign a note which was delivered to the defendant for value and without notice. The maker of the note was held liable for its payment, but he would not have been if it had been retained and payment demanded by the wrongdoer. In general, alcoholic insanity or inebriety is a good defense to an action upon a note if the plaintiff knew of the mental condition of the maker or indorser or had such knowledge as to lead a reasonable man to believe he was not of sound mind. But if the inebriate, whether insane or not, received full value for the note and it has passed into the hands of an innocent third person without knowledge and for value, the defense of inebriety will not avail.

If an inebriate or other person purposely makes himself drunk when assuming an obligation in order to avoid the subsequent fulfilment of his promise, the defense of inebriety will not bar an action by the aggrieved party. On the other hand, when an inebriate or other person is deliberately and purposely made drunk with the intent to perpetrate a fraud upon him, the law will set the compact aside.

**Inebriety and Life-insurance.**—It sometimes happens that insurance companies contest the payment of policies on the ground that the insured fraudulently deceived them in regard to his intemperate habits. The statement of the insured that he is of temperate habits is a statement of fact and not of opinion, and the truth or falsity of such a statement is a matter for the consideration of the jury. Whether an individual is temperate or not is sometimes a difficult question to determine. Temperance does not mean total abstemiousness from intoxicants, and occasional indulgence in liquor cannot appropriately be termed intemperance. The jury has even held that a man may have an attack of delirium tremens and yet be of temperate habits.<sup>2</sup> But there is no reason to doubt that the statement of the insured that he is of temperate habits, when in fact he is an inebriate, is a fraud upon the company sufficiently material to avoid the contract. The statement of a dipsomaniac that he has never been insane when, in fact, he has had repeated attacks of his malady may or may not avoid the policy, according to the circumstances of the case. Many dipsomaniacs do not know that dipsomania is regarded in medicine as a form of insanity. They may even consider themselves to be of temperate habits, and their friends may so consider them, because many dipsomaniacs are absolutely abstemious between their periodic seizures, and these may not be of frequent occurrence. If under these circumstances he states it to be his

<sup>1</sup> 91 Pa., 17.

<sup>2</sup> Knickerbocker Life Assurance Company of New York *vs.* Foley, 15 Otto, 350.



*opinion* that he is temperate and free from insanity, such a statement would not be sufficient to avoid the policy, but if he stated these things as *matters of fact*, his ignorance of their truth would not be sufficient excuse.

Suicide, in some life policies and in all accident policies, is agreed to be a valid defense to the payment of the claim. If suicide is further qualified by the additional clause of whether "sane or insane," the fact that the inebriate took his life, acting in accordance with delusion or during a paroxysm of delirium, makes no difference—the policy could not be enforced. But even if such qualifying words are omitted—and they seldom are—the insanity must be of such a degree that the inebriate does not comprehend that his act will cause death or else that it was accomplished under the influence of an irresistible impulse or delusion.

**Torts and Inebriety.**—Inebriety may be a valid defense in some cases of tort, or it may so modify the tort that it can properly be urged in mitigation of damages, or, in other cases again, it may so aggravate the injury that it may serve the injured party by enabling him to recover exemplary damages. A tort committed against the person or character by one who, though usually of temperate habits, is intoxicated at the time, cannot be successfully defended on the plea of intoxication. It is no defense at all, and an individual who frequently commits assaults, destroys property, or perpetrates other torts when intoxicated may be assessed exemplary damages by way of punishment. Neither law nor medicine regards that form of inebriety as a disease. The law is apt to look upon it more in the light of an aggravation of the wrong, and is inclined to inflict severer punishment upon successive repetitions of the offense. Inebriety committed intentionally for the purpose of mitigating the punishment of a contemplated tort is, of course, not a valid defense.

In dipsomania, during the paroxysm and after the repeated libations, the maniac may be absolutely morally irresponsible for his acts. In chronic inebriety there is often so confused a mental state or such a degree of delirium that the significance of acts committed may not be intelligently appreciated. Here, also, there may be little or no moral responsibility. In alcoholic insanity the inebriate who acts in conformity with his delusions or is impelled by a sudden overwhelming impulse is likewise morally irresponsible, and yet in all these cases the law, while recognizing his irresponsibility, will hold the inebriate to strict account for any pecuniary damage the injured party may have sustained.

It may, therefore, be regarded, as a rule, that inebriates, whether insane or otherwise, mentally irresponsible or not, are liable in civil suits for any damage to person or property. In regard to injuries to character such as arise from libel and slander, the law is not uniform in the different states. Thus in *Gates vs. Meredith*<sup>1</sup> it was decided that insanity caused by drunkenness was a valid defense to an action for slander. The learned judge held that "slander must be malicious,

<sup>1</sup> 7 Ind., 440.

and an idiot or lunatic cannot be guilty of malice, no matter from what cause he became so." This is true neither in law nor in medicine. An inebriate or an alcoholic lunatic, as well as in other forms of lunacy, may commit a tort because he is impelled to do so by reason of his hallucinations or delusions, or he may do the wrongful acts from the same sane reasons that other people do them. In the first case there can, of course, be no malice, but in the second case the malicious intent may be just as pronounced as it would be in a perfectly sane person. In New York the law conforms to this view. There could certainly be no malice in the accusation of an insane inebriate acting in accordance with his delusions that a certain individual was engaged in a disgraceful intrigue with his, the inebriate's, wife. But let us suppose he charges another with being dishonest and that the accusation is not based upon the presence of a delusion. In such a case the element of malice is as much to be inferred as it would be in any one else.

In brief, then, an inebriate is liable, in a civil suit, to compensate in damages any one whom his acts have injured either in person or in property. This rule of law is intended not so much as a punishment for inebriety, but because an innocent person has been injured and it is only just and equitable that he who does the injury, although free from any evil intent, should bear the loss. But in tort, in which the element of malice is essential, such as in malicious prosecution, libel, and slander, inebriety may be urged in mitigation of damages on the ground that the words, either spoken or written, emanated from a diseased mind and consequently would carry but little weight or do but little harm. It would be for the jury, taking into consideration the mental state of the defendant at the time of the act, to determine the measure of damages.

**Wills and Inebriety.**—Inebriety may affect the validity of wills because the inebriate may not possess testamentary capacity, or because the influence of insane delusions may be so pronounced that the will cannot be supported; or because the evidence of undue influence is so apparent that it cannot be disregarded. The law always upholds a will if it can consistently do so, and rarely, if ever, sets it aside unless compelled to by the most positive proof of the maker's incapacity. At the time of intoxication, or by reason of habitual inebriety or alcoholic insanity, the mind of the testator may be so confused, enfeebled, or diseased that he cannot fulfil the requirements of the law in regard to his testamentary mental capacity. On the other hand, he may be suffering from any of these forms of inebriety and yet execute a will that can very properly be sustained at law.

The simple evidence that the testator was intoxicated at the time he made his will, or that he was suffering from a certain amount of mental degeneration from chronic alcoholism or alcoholic insanity, is not in itself sufficient evidence to warrant the assumption of testamentary incapacity. Each case must be considered by itself in order to comprehend the exact mental condition of the testator at the time the will was made. Testamentary capacity consists in the ability of the testator to

understand the nature of the act he is committing, the property he possesses, the disposition he wishes to make of his property, and the relation of each of these factors to the others. The effect of inebriety upon the mind must be measured by these tests and not by the frequency of intoxication or the duration of the disease.<sup>1</sup> In one case the testator bequeathed \$500 to his wife and the same sum to his daughter, and the balance of his estate, valued at \$15,000, was divided among his brothers. He was addicted to the excessive use of intoxicating liquors, which had impaired, to some extent, both his mental and physical powers. But while at times he seemed to be afflicted with dulness and loss of memory, at other times he exhibited a keen, shrewd capacity for business and a strong will. When the will was executed the testimony showed he had been drinking a little, but not to such an extent as to disorder his faculties or prevent his judgment. *Held* that lack of testamentary capacity was not shown.<sup>2</sup> But such a degree of intoxication as would render a person unable to reason or to comprehend the nature of his acts would unquestionably invalidate the instrument. For the same reasons a will executed during alcoholic delirium would be void, and if the mind of the chronic inebriate is so degenerated that at the time of making the will his memory, intelligence, volition, and reasoning faculties are so impaired that he cannot comply with the tests previously mentioned, his testamentary incapacity must be admitted.

Inebriates, particularly in chronic alcoholism and alcoholic insanity, are frequently dominated by delusions which may or may not invalidate their wills. If the delusion does not influence the mind of the testator in the making of the will, it cannot be said to affect its validity. In one case<sup>3</sup> it was held that if a testator possesses sufficient mental power to take into account all the considerations necessary to the proper making of a will, although he is subject to some delusions, yet if it appears that such delusions did not influence him in making his will, his will is entitled to be regarded as a valid testamentary act, and should be upheld.<sup>4</sup> But when a will is made in conformity with well-marked delusions, the testator is insane, and the insanity so taints the will that it may be set aside readily. An insane inebriate who has been adjudged insane may possibly make a valid will, but in such a case "the facts establishing intelligent action must be shown."

Inebriates, on account of the mental enfeeblement which usually accompanies inebriety, can sometimes be unduly influenced to make wills disposing of their property in a manner foreign to their natural inclinations. Even the usually temperate person may, in a condition of inebriety, yield to an influence he could readily comprehend and withstand in his normal condition. Undue influence, when it can be proved, vitiates the will. Judge Earle<sup>5</sup> expresses the law concisely on this point: "To make influence exercised over a testator undue and

<sup>1</sup> 45 N. J. Eq., 702.

<sup>2</sup> Reeves, *Cases on Wills*.

<sup>3</sup> *Bankers vs. Goodfellow*, L. R. 5 Q. B. B., 549.

<sup>4</sup> Reeves, *loc. cit.*

<sup>5</sup> *Rollwagen vs. Rollwagen et al.*, 63 N. Y., 504.



illegal, it must be such as to destroy the free agency; it is immaterial how little the influence may be, if free agency is thereby destroyed." Again he says: "Undue influence may be shown by all the facts and circumstances surrounding the testator, the nature of the will, his family relations, the condition of his health and mind, the depending upon the subjection to the control of the person supposed to have wielded the influence, the opportunity and disposition to wield it, and the acts and declarations of such person."<sup>1</sup> The fact that a will was made during a period of inebriety, or by one whose mind is weakened or perverted by long-continued alcoholic excesses, and that the testator has disposed of his property in an unexpected or extraordinary manner, are not in themselves facts sufficient to prove undue influence. The influence itself must be shown, and then that the inebriate's mind was so impaired, either temporarily or permanently, that the influences brought to bear upon him seriously prevented the free expression of his will. The degree of influence which must be exercised to overcome the will of the inebriate varies in different cases in proportion to the mental degeneration present. In the initial stage of chronic alcoholism influence of the strongest kind may be necessary before the testator's will can be shaped by others, while in alcoholic dementia mere solicitation may be amply sufficient to constitute undue influence.

**Marriage and Inebriety.**—Marriage is a contract the validity of which, as in other contracts, depends upon the consent of the parties and the agreement of their minds. It sometimes happens that an individual, while intoxicated, is induced to marry a person whom he would not marry if he was sober. Such a marriage is not void, but voidable. He may, if he chooses, when he returns to a condition of sobriety openly acknowledge the marriage to be valid, or he may, with knowledge of the marriage, consummate it and thus make the contract binding. In such cases the subsequent attempt to invalidate the marriage on the grounds of intoxication at the time would be no defense at all. On the other hand, intoxication is a valid defense if the so-called marriage is promptly repudiated, and it can be shown that the plaintiff's mind was so affected by alcohol that his free consent and agreement were not obtained. In dipsomania a marriage contracted during a paroxysm of inebriety would be voidable. It could, just as in the form of intoxication just mentioned, be made either a binding marriage or else repudiated, the same reasons for either course being applicable to both forms of inebriety. But it is by no means so certain that a marriage contracted during the sane periods of a dipsomaniac's life could be invalidated. It certainly could not be by the dipsomaniac himself. It is generally the case that the mind of the dipsomaniac between his periodic attacks is almost, if not quite, in a normal condition. He is perfectly able to enter into valid contractual relations, to understand the nature of his acts, to reason, to agree, and to give his consent just as intelligently as any one else. Dipsomania is clearly no defense under such circumstances. The rights of the other party to the contract cannot be,

<sup>1</sup> Reeves, Cases on Wills.

however, so readily determined. If the contract was entered into with the knowledge that the defendant was afflicted with dipsomania, such knowledge would be an effectual bar to the annulment of the marriage. But if, on the other hand, the plaintiff, before the marriage, was ignorant of the existence of the dipsomania, the case might be different. Of course, if the plaintiff, after knowledge of the facts, continues to live with the defendant, it would certainly be regarded as a waiver of any right to rescind the contract, and would be an effectual bar to a subsequent action. If, however, the plaintiff terminated the marriage relations on the discovery that the defendant was a dipsomaniac, equity might grant relief on the ground of fraud; that the defendant, knowing he was suffering from a form of insanity, should have informed the plaintiff before execution of the contract, and that the withholding of such knowledge was a fraud. Leading cases hold, however, that a marriage entered into during what is termed in law a "lucid interval" is a valid marriage, because the party in question, at the time of the marriage, was mentally competent to consent.<sup>1</sup> A marriage entered into by a chronic inebriate may be avoided by him if it can be shown that in consequence of his inebriety his mind was so degenerated that he could not comprehend the nature of his act; otherwise the marriage would be valid, and a marriage by one afflicted with alcoholic insanity is void, but even in such a case it is far safer to have the marriage legally declared void.

**Divorce and Inebriety.**—The laws of the different states vary greatly in regard to the causes for absolute divorce. In New York divorce can be granted only for adultery, but in other states decrees are often granted for much less serious offenses. In some states habitual drunkenness constitutes ample grounds for divorce, but occasional attacks of inebriety would hardly be considered a sufficient cause even in those states in which the divorce laws are most lax. In many of the states partial divorce may be obtained for habitual drunkenness, particularly if it can be shown that the inebriate has become cruel thereby, endangering the life, limb, body, or health of the other party.

In alcoholic insanity there are often delusions and impulses of a libidinous nature, which frequently impel the individual to commit adultery, rape, or other sexual acts. Whether divorce can be obtained or not in such cases depends upon the state in which the act complained of was committed. Thus, in Pennsylvania it has been held that the adultery of an insane wife is a valid cause for divorce,<sup>2</sup> while in Vermont a diametrically opposite rule is maintained.<sup>3</sup> In general it may be said that sexual acts perpetrated by inebriates in consequence of delusions and uncontrollable impulses are not valid grounds for divorce, but they would be, without doubt, if it could be shown that there was no relation between the acts complained of and the delusions.

<sup>1</sup> *Banker vs. Banker*, 63 N. Y., 409; *Smith vs. Smith*, 47 Miss., 211.

<sup>2</sup> *Matchin vs. Matchin*, 6 Pa. St., 352.

<sup>3</sup> *Nichols vs. Nichols*, 31 Vt., 328.

**Breach of Promise to Marry.**—Inebriety may sometimes constitute a valid defense in an action for breach of promise to marry. In other cases it may very properly be urged in mitigation of damages. Many instances are recorded in which a designing person has induced another, who was at the time intoxicated, to promise marriage. Whether such a promise can be avoided by the plea of intoxication depends to a great extent upon the degree of drunkenness of the promiser. An individual may be, to a certain extent, under the influence of alcohol, and yet be quite capable of comprehending the nature of his acts and of appreciating the effects of his promise. In such a case inebriety would not constitute a valid defense. On the other hand, drunkenness may be so profound that the contractual nature of the promise and the consequent legal relationship between the parties cannot be understood. Here, of course, the contract is voidable. There would not be, in the legal sense, an agreement of the minds, and consequently there would be no contract. In either case the defendant, in order to make his condition of inebriety a valid defense, must repudiate the promise at the earliest possible moment. The promise is only voidable and not void, and subsequent words or conduct on the part of the promiser which in any way acknowledge the promise make it binding. If the promise is obtained by fraud, such as, for instance, by making a person drunk purposely in order to secure the promise, the transaction will be absolutely void. Promises to marry made during an attack of dipsomania, in chronic alcoholism, or in alcoholic insanity, may be avoided if the defendant can show that at the time of the promise he had not sufficient mind to make a valid contract or that his mental faculties were so perverted that he did not comprehend the nature of his act.

The defendant may attempt to justify his breach of promise by charging the plaintiff with inebriety. If the charge is true and the defendant knew it to be true at the time the promise to marry was given, it is no defense to the action, because, knowing the truth, he need not have promised. But if he had no knowledge at the time he made the promise that the plaintiff was an inebriate, his plea would constitute a complete defense, particularly if the inebriety took the form of dipsomania or alcoholic insanity. Chronic inebriety would be a good defense, though it is difficult to comprehend how such a condition could exist on the part of one party without the knowledge of the other. Frequent acts of intoxication on the part of the plaintiff may be a sufficient reason for repudiating the promise, but a single instance of drunkenness, unless associated with circumstances tending to aggravate the offense, would hardly be deemed a valid excuse for voiding the contract. In any event drunkenness on the part of the plaintiff may be urged in mitigation of damages, but it must be shown to the satisfaction of the jury that the defendant had knowledge of the inebriety when the promise was given; that the charge of inebriety is true; and that it is because of the inebriety that the promise is broken. The allegations of inebriety must be absolutely proved. Failure to do so would afford ample grounds for heavy damages.



In a certain proportion of cases of inebriety the sexual powers gradually fail and may become extinct, so that impotence results. This, though known to both parties at the time the promise was made, may be a good defense. In a case<sup>1</sup> a statute made the marriage of an impotent person void. In states in which a similar statute has not been enacted, impotence, known or unknown to the parties, makes the promise voidable but not void.

**Inebriety and Crime.**—Crime may, and usually does, violate a personal right, but it is also an offense against the state. In many instances the person injured, or his legal representative, has no redress at all, while the state may inflict proper punishment upon the wrongdoer for his act. In murders, for instance, the murderer, though not liable in a civil suit for damages, will be punished by the state for his crime. In other cases in which the act complained of is both a tort and a crime, the wrongdoer may be liable to both civil and criminal prosecutions. Damages may be recovered for the tort, and the state may also inflict punishment for the infringement of its laws. Assault and battery is both a tort and a crime. The injured individual may properly seek compensation in damages, while the state will punish the offender according to his deserts.

A great proportion of all crimes committed is perpetrated during, or because of, some form of inebriety. Sachs<sup>2</sup> states that in Germany "fully 50 per cent. of all crimes are committed under the influence of alcoholic excesses; in England and America the percentage is, no doubt, equally high." Whether inebriety may be interposed as a valid defense to crime depends entirely upon the character and degree of intoxication and the relation which the particular instance of drunkenness bears to the crime connected with it. Thus in some cases the offense may be aggravated by the fact of the perpetrator's intoxication. Again, inebriety may be no defense at all, or it may be a complete defense, or, if not a complete defense, it may change the character of the offense charged to one of lesser degree and so mitigate the punishment.

Irresponsibility due to inebriety is so frequently urged as a defense for crime that courts and juries are prone to regard such a defense with suspicion and distrust. The tests which courts usually apply to determine the legal responsibility of lunatics for their criminal acts cannot with equal justice be applied to all forms of inebriety. In New York if a lunatic is laboring under such a defect of reason as not to know either the nature or the quality of the act he was doing, he cannot be held accountable on a criminal charge. In other states the law is practically the same. In voluntary inebriety—that is, inebriety which an individual usually of temperate habits commits—the mental faculties may be so utterly deranged that he may neither comprehend the nature of his act nor be able to discriminate between right and wrong, and yet his mental condition may not entirely excuse him in the eyes of the law for a crime committed during his debauch. The reason is obvious.

<sup>1</sup> *Gulick vs. Gulick*, 41 N. J. L., 13.

<sup>2</sup> *System of Legal Medicine*.

Insanity is the result of disease of the brain contracted against the will of the sufferer, and is universally regarded a misfortune and an unavoidable affliction for which the individual must be held irresponsible. Voluntary inebriety, on the other hand, is not a disease at all; it is not unavoidable, but, on the contrary, may be readily prevented by the individual himself. The law, therefore, refuses to relieve him from the responsibility for deeds committed by him while intoxicated, even if drunkenness has induced such a mental state that he has become unable to distinguish right from wrong or the nature of his act.

In this country the test determining the responsibility of the lunatic for his criminal acts is the same no matter what the form of mental disease may be. If he can understand the nature of his act or distinguish right from wrong, he is held fully responsible for his crimes. While this may be a competent test in some forms of lunacy, it certainly is not in others. It is not probable, however, that the law will be changed until jurists arrive at a more comprehensive understanding of the nature of insanity. Many lunatics act in accordance with their delusions and in response to impulses which are often irresistible. This is certainly the case in many cases of alcoholic insanity and in other varieties of insanity also. The alcoholic lunatic may be perfectly aware of the nature of his act, and may also know that it is wrongful, and yet the disease of his brain may so diminish his powers of resistance that he cannot help but yield to a dominating impulse and commit a criminal act. At law he might be held responsible, but from a medical standpoint he is as clearly irresponsible as the most dangerous paranoiac. In time the courts must accept this doctrine, and then a modification of the present law will necessarily follow.

Voluntary intoxication is no excuse for the commission of a crime. On the contrary, an individual who, when intoxicated, frequently perpetrates outrageous acts, may find when he commits a crime under a similar condition that the fact of his intoxication, instead of mitigating his punishment, may be a most potent factor in determining the Court to withhold that judicial clemency which may or may not be granted at the Court's discretion. In a case known to the writer the Court, in passing sentence upon an offender who had been convicted of a criminal act while intoxicated, stated that the fact that he had been convicted several times previously for similar offenses committed under similar conditions left him no alternative but to inflict the most severe punishment the law allowed. Had it been his first offense it is more than probable a much lighter penalty would have satisfied the law.

Although voluntary intoxication may be no excuse for escaping all punishment, it may, under certain circumstances, be urged for the purpose of diminishing the degree of the crime committed. In New York whenever the actual existence of any particular purpose, motive, or intent is a necessary element to constitute a particular species or degree of crime, the jury may take into consideration the fact that the accused was intoxicated at the time, in determining the purpose, motive,

or intent with which he committed the act.<sup>1</sup> This is the law generally throughout the United States. Intoxication plays an important part, therefore, in such crimes as murder, burglary, forgery, and others in which the intent to commit the crime is a most important element in determining the degree of the crime for which the accused shall be punished. Thus in the crime of murder in the first degree the elements of deliberation and premeditation are most essential. If these can be eliminated by showing that the degree of the prisoner's intoxication as evinced from all the attending circumstances was such that he acted without motive and from the blind fury of alcoholic mania, it at once classifies his crime as less than murder in the first degree, and, of course changes the character of the punishment. Murder in the second degree requires an intent to kill without premeditation and deliberation.

In many cases of alcoholism and alcoholic insanity the condition of the mind is such that the question necessarily arises whether the individual was capable of forming an intent or not. If not, then the crime committed was manslaughter. Beyond this point voluntary intoxication, although terminating in temporary insanity, is no defense. Whether the intoxication is of such a degree as to exclude the probability of premeditation and deliberation or of forming an intent to kill are questions for the jury to decide. In a case that came under the writer's personal observation the accused and his wife had separated, but agreed to live together again. Both had been in the habit of occasionally drinking to excess. On the day of their reunion they began drinking immoderately, and continued it, together with excessive sexual intercourse, for a period of about a week. During this time they had frequent quarrels, during which he struck her and threatened her life. These altercations were followed by further debauchery and by periods during which both remained in alcoholic stupor, sometimes for hours. At the expiration of about a week, and at the end of a drunken sleep, the wife went into an adjoining room, leaving her husband apparently in a stuporous condition. Shortly afterward, without any warning, he rushed into the room in which she was, seized a knife, and plunged it several times into her body. The crime was accomplished with every evidence of great brutality. After the murder he seemed stupid for a short time, then regained his senses, but professed absolute ignorance of having killed his wife. His defense was acute alcoholic insanity. Here the intoxication, being voluntary, was no excuse for the crime, but it was a good defense to the charge of murder in the first degree, because the sudden seizure of alcoholic furor robbed the crime of the elements of deliberation and premeditation. It was murder, of course, but not in the first degree. It is not always, however, a good defense.

In a recent murder case in Philadelphia the accused killed a woman, and then in his defense urged the plea of intoxication. He claimed that he was intoxicated to such a degree that he was unconscious of his act. To the minds of the jurors the facts and circumstances of the case did not seem to support this view, and he was convicted of murder

<sup>1</sup> Penal Code, § 22.



in the first degree. In the case of the *People vs. Fish*<sup>1</sup> it was held that "if the accused be sober enough to and does form an intent and so deliberate upon and premeditate the crime, then he is responsible the same as if he had been perfectly sober, and that he is guilty, even though intoxicated." When a person becomes voluntarily intoxicated in order to facilitate the accomplishment of a crime, the proof of the intoxication is no defense at all. If it could be so regarded, or if it could even be urged in mitigation of punishment, it would probably be the preliminary act to most cases of crime.

Voluntary drunkenness is no defense to crime when the wrongful act is planned or partly executed before the individual becomes intoxicated. In the case of *Hamlin vs. the State*,<sup>2</sup> Hamlin was convicted of murder in the first degree. In attempting to escape from prison he killed a watchman. He petitioned for a new trial on the ground that he was intoxicated at the time of the murder. It was known that for some time previous he had made preparations for the escape by bribing one of the watchmen, but afterward decided to escape by attacking the guard and making a bold dash, and that he had waited for two hours for an opportunity to make the attack. It was claimed that while thus waiting the prisoner became intoxicated. In refusing his petition for a new trial the Supreme Court of Errors held that, conceding that Hamlin was intoxicated when the attack was made, he had previously participated in the preparations therefor, even to the extent of taking human life, he having armed himself; that in view of these facts the attack and its consequences were premeditated, and the intoxication at the time of the murder could be of no avail as a mitigating circumstance.<sup>3</sup>

In most cases of murder in which the plea of intoxication has been successfully introduced it has been urged only in order to rob the crime of the element of deliberation and premeditation, and secure a verdict of murder in the second degree, instead of the first degree. Murder in the second degree includes those cases in which there is a design to effect the death of a person, but without deliberation or premeditation. Can it be said that in all cases in which an individual while in a state of alcoholic frenzy kills another that he has the design to effect the death of the person killed? In other words, is it an intentional killing? To the layman, even to the skilled jurist, it would seem as if this question must be answered in the affirmative. The crime is often accompanied by words and acts which naturally seem to imply the intent to kill, and it is generally conceded, even by the counsel for the defense, that the defendant must have intended to kill at the moment when the crime was perpetrated. Alienists, however, are well aware that individuals in certain mental conditions may perform acts which are often of a criminal nature and which appear to be done purposely, but which are perpetrated without consciousness. There must, of course, be a sub-conscious condition remaining, because if all consciousness is abolished,

<sup>1</sup> 125 N. Y., 136.

<sup>2</sup> 48 Conn. Rep., 92.

<sup>3</sup> Med. Jurisp., Hamilton.

the individual becomes absolutely insensible; but a subconsciousness may exist while the higher consciousness remains dormant. In this state of subconsciousness acts may be performed of which the individual will have no knowledge whatever when his higher consciousness awakes. This subconscious state is seen in psychic epilepsy, hypnosis, somnambulism, and in alcoholic epilepsy and some cases of alcoholic mania. Can an individual in a condition of subconsciousness form a design to kill? Clearly he cannot. If this state of mind can be demonstrated to the satisfaction of the jury to have existed at the moment of the homicide, the crime cannot be regarded as murder at all, but must be considered merely as manslaughter.

For a long time this condition of subconsciousness was practically denied by the courts, but in the case of the People *vs.* Leonard,<sup>1</sup> Judge Peckham, after citing section twenty-two of the penal code, stated as follows: "When it appears upon the trial that the defendant was intoxicated when he committed the homicide, the jury should be instructed that if the intoxication has extended so far in its effects that the necessary intent, deliberation, and premeditation were absent, the fact of intoxication must be considered and a verdict rendered in accordance therewith. In such a case the intoxication need not be to the extent of depriving the accused of all power of volition or of all ability to form an intent."

It cannot for a moment be claimed that all persons who commit crimes while intoxicated are in an automatic or subconscious condition. Whether they are or not must be proved by the circumstances attached to each particular case, but when it is so proved, the charge of intent to kill should fail.

Intention is also an essential element in such important crimes as burglary and forgery; and intoxication, when proved, may be considered by the jury in determining the question of whether there was intent or not. In the crime of arson the case is different. If the firing was committed wilfully, the plea of intoxication will not avail. In the case of the People *vs.* Jones<sup>2</sup> it was held that intoxication is not to be considered in a case of arson, where it appears that the act of setting on fire was wilfully done, it being of no consequence what the intention was.

Crimes committed by dipsomaniacs during a paroxysm of the disease or by those afflicted with alcoholic insanity should be regarded in the same light as crimes committed by lunatics generally. The dipsomaniac is commonly regarded as a drunkard, who differs from other inebriates only in that his indulgences are periodic. Dipsomania is in reality a form of insanity, and the blind craving for drink is merely one of many symptoms of the disease. During a paroxysm a dipsomaniac may commit a criminal act. If so, the deed is usually regarded as if it had been perpetrated by one in a condition of voluntary intoxication. If it can be shown that the homicide, for instance, was accomplished during an attack of maniacal furor, the evidence that such a state was

<sup>1</sup> 143 N. Y., 360.

<sup>2</sup> 2 Edin. Sel. Cas., 86.

induced by voluntary inebriety may be introduced to diminish the grade of the crime from murder in the first degree to murder in the second degree, or even, according to a decision previously mentioned, to manslaughter, but if the view is held that the dipsomaniac is guilty of voluntary intoxication, it cannot relieve him from the responsibility of his act. On the other hand, dipsomania is regarded as a form of insanity, and if it is further understood that the inebriety is merely a symptom of a serious mental disease, and for which he is in no way responsible, then the law should hold him just as guiltless of crime as if the act had been perpetrated by an individual suffering from any other form of insanity, or, more properly speaking, his case should be judged by the law applicable to the insanity, and not to inebriety.

Alcoholic insanity is not always a complete defense to crime. Generally it may be said that "if a lunatic is laboring under such a defect of reason as either not to know the nature and quality of the act he was doing, or not to know that the act was wrong, he cannot be held accountable on a criminal charge." Therefore if one who is suffering from alcoholic insanity, acting in conformity with a delusion, commits a criminal act, he is held blameless. But if, though insane, he commits a criminal act, judged by motives which have no connection with his insanity, the defense of insanity can avail him nothing. An alcoholic lunatic who commits homicide under the delusion that his victim is poisoning him or has debauched his wife does an insane act and is clearly not guilty of crime, but if he kills another for the sake of needed money or in revenge for an actual injury, he must be regarded as sane so far as the commission of such acts is concerned, and is fully as responsible for them as if no insanity existed.

Sudden and often uncontrollable impulses to kill or injure, known as morbid impulses, are not uncommon with alcoholic lunatics and dipsomaniacs. They may understand the nature and consequences of these impulses and know that it is wrong to yield to them, and yet be absolutely unable to resist. Such unfortunates, unless insanity is well marked, are not recognized in law as having any valid defense. The law as it now stands is well expressed in the decision in the case of the People *vs.* Coleman: "A criminal act cannot be excused upon the theory of an irresistible impulse when the offender knew what he was doing and had the ability to discover his legal and moral duty in respect to it." It is not difficult to understand the view the law takes in regard to the irresistible impulse. If it was once admitted as a valid defense, it is more than probable it would be urged as an excuse for the majority of crimes. Nevertheless, there is a small proportion of cases in which the irresistible impulse should be a good defense, and probably, in time, jurists will come to recognize this fact.



# THE STIGMATA OF DEGENERATION

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THE question of degeneracy in its medicolegal relations has come into greater and greater prominence in recent years, owing to the researches of numerous investigators in the rich fields afforded by the asylum, the reformatory, and the prison. It is now apparent that insanity, imbecility, drunkenness, epilepsy, and criminal tendencies in antecedents may, with or without modification or interchange, become the woeful heritage of the children; that there is a proclivity in a tainted family to the progressive deterioration which we call degeneracy, and that such degeneracy may often be recognized by the signets of morbid heredity set upon the victims. The writer believes the subject of such importance to both physician and lawyer that it is accorded a special chapter in this book; and the chapter is founded upon the studies he has made and published elsewhere<sup>1</sup> from a considerable experience in reformatories, prisons, and institutions for idiots and insane.

**Definition of Degeneracy.**—Degeneracy may be defined as a morbid deviation from the normal original type or standard. It is recognized, as a rule, in its effects upon the intellectual life, in the deviations from the intellectual habits and social conduct which are held in common with our fellows. To the class of degenerates belong not only many criminals, idiots, and insane individuals, but also the great majority of persons called cranks or eccentrics—the people who live a sort of original life, with peculiarities of mental habit and conduct, and who are characterized as feeble-minded, quaint, odd, queer, or singular.

A man of talent or of genius often presents eccentricities of this kind, but such deviation from the original normal standard need not be morbid in character; it may be a deviation toward a higher and better standard, recognized by his contemporaries or posterity to be such. It might be difficult at times to distinguish between the eccentricities of genius and the eccentricities of degeneracy. There are one or two indications or tests which will aid us in this. One of the indications—in fact, the chief test of a normal state—is, naturally, conformity to the social condition in which a man lives. This test applied by itself, however, does not exclude talented individuals and geniuses. Another criterion must be applied to these cases. Is there conjoined with the eccentricity a morbid self-centering of his interests? It is in individuals who concern themselves little with the affairs of the world, but much with

<sup>1</sup> Medical Record, June, 1888; American Journal of Insanity, July, 1895; International Dental Journal, December, 1895; State Hospitals Bulletin, July, 1896.

personal and selfish matters, that eccentricity of intellectual habit or conduct warrants a grave diagnosis. Now, one of the essential characteristics is its inclusion of transmissible elements, so that the degenerate individual not only bears in himself the germs which render him more and more incapable of fulfilling his own functions in human life, but, by his hereditary bequests, he menaces the intellectual stability of his descendants.

So much for the definition of the term "degeneracy." We will now pass on to a consideration of the indications of degeneracy.

## STIGMATA OF DEGENERATION

The indications of degeneracy are known as *stigmata hereditatis*, or stigmata of degeneration. They may be defined as anatomic or functional deviations from the normal which in themselves are usually of little importance as regards the existence of an organism, but are characteristic of a latent or marked neuropathic disposition. These stigmata are vices of functional and organic evolution. The deviations from the normal may be in the way of excesses or arrest of development. They must be distinguished from the deficiencies or deformities produced by accidents at birth or by disease. I have said that these stigmata are anatomic and functional. But it is more convenient to divide the functional group into physiologic and psychic classes. It is the latter which we are more apt to observe in our relations with degenerate individuals. The psychic stigmata are always characterized by a want of balance or lack of proportion between certain undeveloped or excessively developed faculties and other faculties which are normal. Defect of moral sense, of attention, of memory, will, judgment, or unbalanced excess of musical or mathematic aptitudes may be cited as instances of psychic stigmata. Hence the following three divisions may be made of all the degenerative indices:

1. Anatomic stigmata.
2. Physiologic stigmata.
3. Psychic stigmata.

### ANATOMIC STIGMATA

Cranial anomalies.

Facial asymmetry.

Deformities of the palate.

Dental anomalies.

Anomalies of the tongue and lips.

Anomalies of the nose.

Anomalies of the eye: Flecks on the iris; strabismus; chromatic asymmetry of the iris; narrow palpebral fissures; albinism; congenital cataracts; microphthalmos; pigmentary retinitis; muscular insufficiency.

Anomalies of the ear.

Anomalies of the limbs: Polydactyly; syndactyly; ectrodactyly; symmelus; ectromelus; phocomelus; excessive length of the arms.

Anomalies of the body in general: Hernias; malformations of the breasts and thorax; dwarfishness; giantism; infantilism; feminism; masculinism; spina bifida.

Anomalies of the genital organs.

Anomalies of the skin: Polysarcia; hypertrichosis; absence of hair; premature grayness.

### PHYSIOLOGIC STIGMATA

Anomalies of motor function: Retardation of learning to walk; sties; tremors; epilepsy; nystagmus.

Anomalies of sensory function: Deaf-mutism; neuralgia; migraine; hyperesthesia; anesthesia; blindness; myopia; hypertropia; astigmatism; daltonism; hemeralopia: ecentric limitation of the visual field.

Anomalies of speech: Mutism; defective speech; stammering; stuttering.

Anomalies of genito-urinary function: Sexual irritability; impotence; sterility; urinary incontinence.

Anomalies of instinct or appetite: Uncontrollable appetites (food, liquor, drugs); merycism.

Diminished resistance against external influences and diseases.

Retardation of puberty.

### PSYCHIC STIGMATA

Insanity.

Idiocy.

Imbecility.

Pavor nocturnus.

Precocity; one-sided talents; disequilibrium.

Feeble-mindedness.

Eccentricity.

Moral delinquency.

Sexual perversion.

Before proceeding to the description of these various indices in greater detail it will be well to consider briefly some points in relation to their origin.

### THE ETIOLOGY OF HEREDITARY STIGMATA

When the causes which lead to the formation of the stigmata of degeneration are investigated much difficulty is met with. Usually we must look to modifications occurring during fetal development, during the evolution of the child—modifications brought about by arrests or errors of development, not so much perhaps in the organs themselves, which show the effects, as in the central nervous system—in the nervous mechanism which governs heredity. As the evolution of our bodies as well as our minds depends upon the brain, spinal cord, and the countless nerve-filaments which radiate from them to every tissue, so the nervous system plays the most important part in the influences



which have to do with heredity. The nervous coördinations must be rearranged by strong stimuli in order to reproduce the hereditary impulse. This is why traits acquired by us in our individual lifetime are not apt to be inherited by our descendants. If a person loses an arm, his children are not deprived of that useful member, for the nervous mechanism of development which has for ages produced arms in their proper places and which is fixed in the powerful hereditary impulse of the race has not been changed. So in the breed of dogs whose tails have been cut off for countless generations, not one is born without a tail, because the nervous co-ordinations governing the evolution of the tail bear down with all the hereditary force of the race since its first beginning, when the tail existed though the animal was legless, to keep it in existence. If in some way we could reach the nervous mechanism which is responsible for the evolution of the tail, we might modify or even prevent its development. It is, therefore, some derangement of the nervous mechanism governing heredity which brings about deviations from the normal type, which gives rise to anatomic, physiologic, and psychic anomalies which we designate as the stigmata of degeneration.

How is the nervous mechanism of heredity deranged? It may be readily and profoundly deranged in a variety of ways—for instance, by poisons. Thus, alcohol disarranges the nervous mechanism of heredity in such a way that the descendants may suffer from the drink-craving, from idiocy, insanity, epilepsy, hysteria, neurasthenia, from shattered nervous systems, for at least three generations, and in these unfortunates we find, along with marked functional stigmata of degeneration, these actual physical deviations from the normal type which we call anatomic stigmata. But idiocy, insanity, epilepsy, and the like are in themselves conditions which disarrange the nervous co-ordination so profoundly as to affect the hereditary impulse and give rise to anatomic and functional stigmata in the descendants. What is bequeathed to the degenerate child is a fragile and unstable nervous constitution. The evidence of this inherited fragility of the nerve-mechanism may present itself as epilepsy, or it may be insanity, or it may be feeble-mindedness, or it may be criminal tendencies, or it may be simple nervousness or hysteria or certain kinds of headache, or possibly only eccentricity. All these disorders are more or less interchangeable and are merely proofs of an unstable nervous organization. Where such conditions do not develop they still exist in a latent state, and pass as a legacy to another generation. Whether the neuropathic state is manifest or latent, we are apt to find anatomic stigmata of degeneration present on careful examination.

Of late years the study of the glandular structures of the body has revealed many physical alterations due to excess, diminution or perversion of the secretions of certain glands, called the endocrine glands. These are glands that furnish their secretions to the blood flowing through them. They are called internal secretions, and the science relating to them is termed endocrinology. For instance, defect of thyroid secretion in newborn or growing children produces cretinism with

dwarfing of growth; in adults it leads to myxedema. In both these conditions there is thinning of the hair and alteration in development and soundness of the teeth. On the other hand, excess of thyroid secretion induces a disease known as exophthalmic goiter characterized by acceleration of heart action, enlarged thyroid gland, and prominence of the eyes.

Another instance of physical changes even more startling produced by disturbance of glandular secretion is that of disorder of the pituitary gland or hypophysis. Here increased secretion induces gigantism and the strange enlargement of hands, feet, face, and jaws known as acromegaly; and sometimes it also causes hypertrichosis. Diminished secretion brings about in adolescents adiposity, feminism, maldeveloped genitals, infantilism. The glands of internal secretion are the thyroid, pituitary, sexual glands (ovaries and testes), parathyroids, adrenals, thymus, pancreas, and pineal glands. Much is still obscure in relation to their function and pathology. Sometimes we have disordered function in several, giving rise to mixed conditions known as pluriglandular syndromes. Disorders of the glands then must be taken into account in estimating the import of certain enumerated stigmata, especially in relation to conditions of hair, teeth, dwarfism, giantism, feminism, infantilism, and genital anomalies. Naturally, these glands are often the seat of an acquired disease that disturbs their function, but it must be borne in mind that inherited instabilities among the endocrine glands may be themselves stigmata of degeneration.

## DESCRIPTION IN DETAIL OF THE STIGMATA OF DEGENERATION

We may now proceed to the description in detail of the anatomic and physiologic anomalies which it has been attempted here to classify.

**Cranial Anomalies.**—Asymmetry of the head and certain deformities to be described constitute the chief cranial stigmata of degeneration. Before passing to a consideration of these, certain general facts should be examined briefly.

A score or more of distinguished anthropologists of the present century have been trying to discover racial distinction in human skulls; but the fact is that there are not so many characteristics of race in the cranium as in other parts of the body, and, accordingly, there are still wide differences of opinion as regards a scientific craniologic classification. Races have been mingling for so many thousands of years that cranial dissimilarities are the rule among them, even in tribes, and to some extent in families. These diversities of form have been designated as dolichocephalic, mesocephalic, and brachycephalic, terms which convey merely an idea of the relation of the length to the breadth of the skull when viewed from above. The anteroposterior is to the biparietal diameter as 100 is to  $x$  is the formula for determining this "cephalic index." All length-breadth indices below 78 are considered dolichocephalic; 78 to 80, mesocephalic; and above 80, brachycephalic. We may assume that the physiologic limits of this index are 70 to 90.

This is based upon thousands of measurements of skulls by various investigators. Any excess or diminution of these figures must hence be regarded as pathologic (Fig. 180).

I would merely make passing mention of the fact that, according to latest classifications (Huxley and others), most Europeans and most of the people east of a line drawn from Lapland to Siam are brachycephalic, that negroes, Australians, English, Irish, and Scandinavians are dolichocephalic, and the Hollanders, mesocephalic.

But while one skull may be narrower or broader than another, there is compensation in other diameters. The dolichocephalic has a greater vertical diameter, for instance, than the brachycephalic skull.

Besides these characteristics, something must be said regarding the physiologic asymmetry of the skull. The fact that the arms and hands are not symmetric on the two sides of the body, either in size or in function; that the legs and feet are not symmetric; that the left cerebral hemisphere is larger and more complicated than the right—would naturally lead us to anticipate some slight asymmetry of the two sides

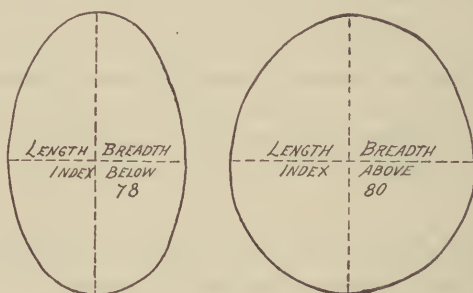


FIG. 180.

of the skull, and the facts of observation support us in the statement that asymmetry is the rule and perfect symmetry the exception. More than a thousand postmortem examinations, the examination of several hundred heads, and an inspection of some collections of skulls, such as that of Blumenbach, where I have particularly noted this point, together with the testimony of others, justify me in this assumption.

Asymmetry sometimes reaches extraordinary proportions, often with quite a normal state of brain function, often with marked psychopathic changes. Outside of purely physiologic asymmetry there is that depending upon defective development and disease. One of the first of nature's constructive principles in fashioning the skull is the struggle of its contents for volume. Hence, as long ago pointed out by Virchow, premature synostosis of any cranial suture will lead to compensatory deformity. So, too, will arrest of development in any center of ossification, or a unilateral aplasia or hyperplasia of the skull bones or of the contents of the skull.

Aside from the deformities of the head, which are congenital in character, the diseases which most commonly produce cephalic deformation



in early life are rachitis and hydrocephalus; in later life tumors, exostoses, otitis, etc.; while at all periods of life the shape of the skull is menaced by injuries from a forceps delivery to a falling brick. The following are some of the commoner designations of well-known cranial deformities:



FIG. 181.—Chemocephalus.

**Chemocephalus** is flat-headedness. In this there is flatness at the top of the head. This is also called *platycephalus* (Fig. 181).

**Leptocephalus.**—Early synostosis of the frontal and sphenoid bones produces leptocephalus, or narrow-headedness (Fig. 182).

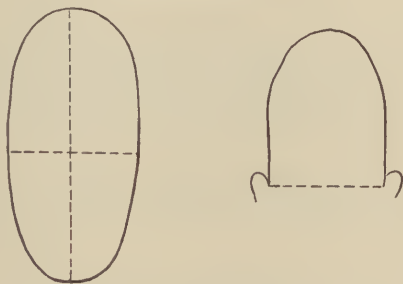


FIG. 182.—Leptocephalus.

**Macrocephalus** is a large head usually due to hydrocephalus.

**Microcephalus** is a small head due either to aplasia of the brain or to premature synostosis of the sutures.

**Oxycephalus**, or steeple-shaped skull, is due to synostosis of the parietal with the occipital and temporal bones, with compensatory de-



FIG. 183.—Oxycephalus.

velopment in the region of the bregma. Another name for this is **acrocephalus** (Fig. 183).

**Plagiocephalus**, or oblique deformity of the head, is due to unilateral synostosis of the frontal with one of the parietal bones (Fig. 184).

**Scaphocephalus** is probably caused either by too early union of the sagittal suture or by the development of both parietal bones from one center. The top of the head is keel shaped (Fig. 185).

**Trigonocephalus**.—Premature union of the frontal suture, resulting in very narrow forehead and great width behind, giving rise to the term trigonocephalus (Fig. 186).

It is to be regretted that there are no studies of the psychic histories of tribes accustomed to producing artificial malformation of their heads

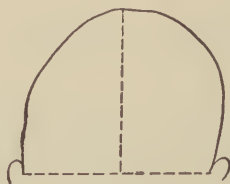


FIG. 184.—Plagiocephalus.

during development. There are eight or ten species of artificial deformity which have been practised from time immemorial among the lower races of mankind, and are still in vogue among certain Polynesian and American tribes. The disfiguration is accomplished by means of bandages, boards, or masses of clay fastened upon the infantile skull to produce the prevailing fashionable shape. Many of these skulls are to be seen in the famous collections at Paris, London, and Göttingen.



FIG. 185.—Scaphocephalus.

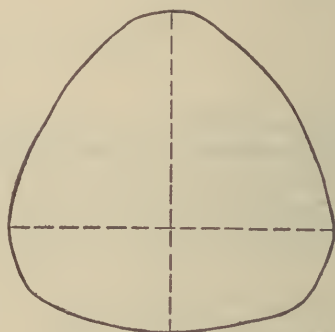


FIG. 186.—Trigonocephalus

It may be affirmed that every segment of the skull represents some particular part of the brain lying beneath it. This may be assumed without proclaiming one's self a proselyte of Gall.

It is certainly true that single convolutions have no very marked influence upon the external configuration of the cranium; but they do, however, strongly impress the inner table of the skull, as will be seen upon examination. The indentations upon the inner table are most distinct on the orbital plate of the frontal, the squamous portion of the

temporal, and the upper part of the occipital bone. The orbital surface of the orbital plate of the frontal is perfectly smooth. The outer table of the occipital presents no ridges correlated to the convolucional imprints within, but, on the contrary, has ridges for muscular attachment. The external surface of the squamous portion of the temporal bone is, indeed, modified by the size of the convolutions of the temporosphenoid lobe, but on the head this portion of the skull is obscured by the temporalis. Yet although single convolutions do not impress themselves to such an extent upon the outer surface of the skull as to be recognized, this is not altogether the case with groups of convolutions. Groups of convolutions do modify the shape of the skull; do possess visible representation upon its outer surface.

The great advance in cerebral localization paves the way to a newer and more scientific, though more limited, phrenology. Thus the parietal bosses correspond chiefly to the sensory, somewhat to the motor, cortical areas. The dimensions of the forehead have a direct relation to the frontal lobes, the higher intellectual substrata. The left temple has been shown by Benedikt, in one case, to be depressed in congenital aphasia. The parieto-occipital portion of the skull is doubtless modified by the countless sight-memories stored up beneath it. I have, myself, noted in large numbers of cases of infantile spastic hemiplegia an alteration in the shape of the skull on the side opposite to the paralysis.<sup>1</sup>

The two systems of measurement—the craniometric and cephalometric—differ but slightly from each other, the former, of course, being the more exact, since every portion of the naked skull is attainable. Both systems, if perfect, require such measurements to be taken as will serve at any time to reconstruct the skull. Geometry and trigonometry are pressed into use. Certain definite points are selected from the arcs and radii, as shown in some of the diagrams. It will be seen that the longitudinal, vertical, and horizontal sections of the normal skull all exhibit a certain and definite number of curves. In fact, its whole surface may be considered as composed of an aggregation of small cycloid surfaces, developed and joined together according to fixed biomechanical laws, just as a fruit is evolved on biomechanical principles, with its definite number of seeds and concentric disposition of substance.

I would recommend the eleven following measurements (Figs. 187 and 188): (1) The circumference; (2) the naso-occipital arc ( $N$  to  $T$ ); (3) the nasobregmatic arc ( $N$  to  $\beta$ ); (4) the bregmatolambdoid arc ( $\beta$  to  $A$ ); (5) the binauricular arc; (6) the anteroposterior diameter ( $S$  to  $O$ ); (7) the greatest transverse diameter (length-breadth index); (8) the binauricular diameter; (9) the two auriculobregmatic radii; (10) the facial length; (11) the empirical greatest height ( $\beta$  to  $B$ ).

In addition to acquiring these mathematic data, cephaloscopic drawings are invaluable as exhibiting deformity clearly to the eye. Hence

<sup>1</sup> Some of the Principles of Craniometry, loc. cit.; Cranial Measurements in Twenty Cases of Infantile Cerebral Hemiplegia, New York Medical Journal, April 6, 1889.



the horizontal circumference, naso-occipital curve, and binauricular curve should be taken with a strip of lead, or, what is better, with the instrument devised by Luys, on the principle of the hatter's conformateurs, and the curves projected on paper.

We will now consider each of these eleven points in detail:

1. The circumference of the skull averages 52 cm. in men and 2 cm. less in women, with a physiologic variation from 48.5 to 57.4 cm. This measurement is taken horizontally around the glabella and the point just above the external occipital protuberance, known as the maximum point, from its giving the greatest anteroposterior diameter (Fig. 188, *S* to *O*). The scalp and hair superadded about 3 cm.; hence in cephalometry about 6 per cent. should be deducted to obtain the measure of the skull (6 per cent. should also be deducted in measurements No. 2 and 5).

An effort has been made by Welcker and others to determine the cubic capacity of the cranium through the relations of some of its diameters or its circumference. But it has been found that the cubic contents vary in different skulls, even when the circumferences are

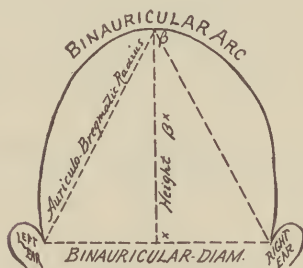


FIG. 187.

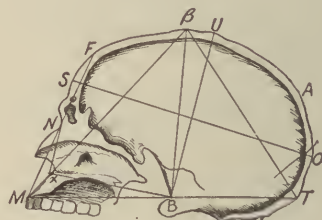


FIG. 188.

equal. It is probable, however, that by the acquisition of long series of cranial diameters and volumes we will in time arrive at some standard for approximating the quantity of brain in any head. A very rough empirical estimate is that where the circumference of the skull is 50 cm., its volume will be about 1350 c.c.

2. The naso-occipital arc is measured from the root of the nose to the lowest part of the external occipital protuberance (*N* to *T*). The average is 32 cm. in men, 1 cm. less in women, with a physiologic variation between 28 and 38 cm.

3. The nasobregmatic or frontal arc, taken from the root of the nose to the bregma (*N* to  $\beta$ ), averages on the skull about 12.5 cm. in men, 12 cm. in women, with a physiologic variation between 10.9 and 14.9 cm.

4. The bregmatolambdoid or parietal arc, which is the measurement of the length of the sagittal suture, and hence the extent of the parietal bones, averages on the skull 12.5 cm. in men, and 6 mm. less in women, with a physiologic variation between 9.1 and 14.4 cm. ( $\beta$  to *A*). The bregma and lambda are easily found on the head after some education of the fingers.

5. The binauricular arc is measured vertically over the top of the skull, following Broca's vertical line, between the two auditory meatuses. We select at the meatus either a point on the anterior rim between the middle and posterior roots of the zygomatic process, easily felt on the head just behind the maxillary articulation, or a point on the posterior superior rim corresponding to a small depression, both of which are fixed points and differ but slightly in elevation. The average is about 32 cm. on the skull in men, 1 cm. less in women, with a physiologic variation between 28.4 and 35 cm.

6. The greatest anteroposterior diameter is taken from the glabella, or middle of the forehead, to the maximal occipital point (*S* to *O*). It averages 17.7 cm. on the skull of men, 5 mm. less in women, with a physiologic variation between 16.5 and 19 cm.

7. The greatest transverse diameter is sometimes between the tubera parietalia; sometimes between the upper portions of the temporal bones. It averages 14.6 cm. in men and 14 cm. in women, with a physiologic variation between 13 and 16.5 cm. As before mentioned, the length-breadth index is obtained from these two diameters, Nos. 6 and 7.

8. The binauricular diameter is taken between either of the points described, on the rims of the auditory meatuses. It averages 12.4 cm. in men, 5 mm. less in women, and the physiologic variation is between 10.9 and 13.9 cm. In measuring the head, the scalp averages 5 mm. in thickness; hence in the larger diameters (Nos. 6 and 7) 1 cm. must be deducted to get the figure for the skull, while in shorter measurements (such as Nos. 8 and 9) it is sufficient to subtract 7 mm.

9. The auriculobregmatic radius of each side is taken from the usual point at the meatus to the bregma. By calculation from these radii and the binauricular diameter we are enabled to ascertain the distance of the bregma from a point in the median plane, half-way between the two meatuses; this distance averages in the normal skull 11.17 cm., with a physiologic variation between 10 and 12.65 cm. (Fig. 187).

10. The facial length is measured from the nasal root to the lowest median point of the inferior maxilla. It averages 12.37 cm., with a physiologic variation between 10.5 and 14.4 cm. Including as it does the teeth, infants and the aged are debarred from this measurement. Dolichocephalic heads have, as a rule, narrow, and brachycephalic broad, faces. Something should here be said concerning prognathism, of which there are several forms. The best method of determining it is to measure the angle made by a line drawn from the nasal root to the junction of the inferior nasal spine and alveolar process (Fig. 188, *N-X*), with a vertical line dropped from the nasal root to Broca's horizontal. It is found that every normal skull exhibits this subnasal prognathism, but there is a wide variation in degree. Extraordinary prognathism, orthognathism, and opisthognathism, meaning extreme projection, straightness, or inclination backward of the subnasal line, are pathologic.

11. The empirical greatest height of the head is an approximate measurement of the distance between the basion and vertex of the skull (*B* to  $\beta$  or *U*). A line from the external occipital protuberance to the

lowest median point of the superior maxilla, just above the incisors ( $T$  to  $M$ ), passes almost directly through the basion. Hence in cephalometry, by taking this diameter and the radii from each extremity to the bregma, we have a triangle ( $M-\beta-T$ ) whose height ( $B-\beta$ ) is easily ascertained. The height averages 13.3 cm. in men, 12.3 cm. in women, and the physiologic variation is from 11.5 to 15 cm.

The only instruments necessary for obtaining the data just described are a pair of calipers, the tape-line, and a strip of sheet lead 2 feet long by  $\frac{1}{2}$  or  $\frac{3}{4}$  inch wide. Benedikt's calipers, manufactured by Wolters in Vienna, which are here exhibited (Fig. 189), are to be recommended for their exactness, as are also those that I have had made for my own use (Fig. 190).

Excessive prognathism is found among criminals, in microcephali, and in cases of hemiplegia and paraplegia plastica infantilis. Skulls known as crania proganæa have considerable pathologic significance. In these the lower teeth project beyond the upper, and the inferior maxillary angle



FIG. 189.—Benedikt's calipers.

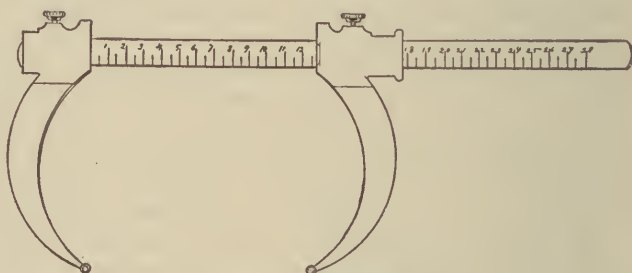


FIG. 190.—Author's calipers.

is obtuse, due probably to aplasia of the upper, or hyperplasia of the lower, maxilla.

The demonstration of the empirical greatest height is often quite valuable as an index of degenerative and neuropathic types.

The general points which should be considered in the examination of these cases are given in the table on page 503.

A skull below the normal type in volume belongs to an abnormal individual.

Undertypical measurements of the head should always lead us to entertain the suspicion of defective cerebration.

Abnormal smallness of any part of the skull permits the conclusion that the part of the brain in its neighborhood is imperfectly developed.


Excessive development of the head has a double signification. It is always pathologic, but may mean abnormality of the brain or successful compensation. Wormian bones are also doubly significant. They represent either a pathologic process or a successful effort of nature in repair.

Hemiplegia spastica infantilis, epilepsy, and intellectual or ethical weakness often exhibit unilateral aplasia of the skull.

The skull is representative of the brain only during the years of its



TABLE OF CRANIOMETRIC MEASUREMENTS

	AVERAGE IN ADULTS IN CENTIMETERS.		Physiologic Variation.	Remarks.
	Males.	Fe-males.		
1. Circumference.....	52	50	48.5-57.4	Roughly approximated, the volume is to the circumference as 1350 c.c. is to 50 cm.
2. Volume.....	1500	1300	1201-1751	
3. Naso-occipital arc.....	32	31	28-38	$N$ to $T'$ (Fig. 188).
4. Nasobregmatic arc.....	12.5	12	10.9-14.9	$N$ to $\beta$ (Fig. 188).
5. Bregmatolambdoid arc..	12.5	11.9	9.1-14.4	$\beta$ to $A$ (Fig. 188).
6. Binauricular arc.....	32	31	28.4-35	
7. Anteroposterior diameter	17.7	17.2	16.5-19	$S$ to $O$ (Fig. 188).
8. Greatest transverse } diameter }....	14.6	14	13-16.5	The formula for the length-breadth index is: Length: Breadth :: 100 : $x$ . An index below 78 is dolichocephalic; 78 to 80, mesocephalic; above 80, brachycephalic.
9. Length-breadth index...	82.2	83.8	76.1-87	
10. Binauricular diameter..	12.4	11.9	10.9-13.9	 <p>The height <math>B-X</math> of the triangle <math>E, B, E</math> formed by the auriculobregmatic radii and the binauricular diameter, averages 11.17, with a variation from 10 to 12.65.</p>
11. Auriculobregmatic radii.				
12. Facial length.....	12.37	....	10.5-14.4	From root of nose (Fig. 188, $N$ ) to lowest part of chin.
13. Empirical greatest } height }....	13.3	12.3	11.5-15	The empirical greatest height, $B-\beta$ , is obtained by measuring the sides of the triangle $M-\beta-T'$ (Fig. 188).

These measurements are those of the adult human skull. As the hair and scalp superadd about 3 cm., about 6 per cent. should be deducted in the head measurements Nos. 1, 3, and 6 to obtain those of the skull. In taking the diameters Nos. 7 and 8, deduct 1 cm. (the scalp averaging 5 mm. in thickness), and from the shorter radii, such as Nos. 10 and 11, subtract but 7 mm.

development, and it must be remembered that psychopathic deterioration often has its inception subsequent to the completion of the process, when no impression can be made upon its bony walls.

**Facial Asymmetry.**—Inequality of the two sides of the face, when congenital and not due to some such disease as hemi-atrophy, is to be

looked upon as a stigma of degeneration. In the same category may be grouped various irregularities, and such conditions as excessive prognathism or retrognathism. Great prominence or unequal prominence of the malar bones is to be observed, and also asymmetry of the orbits.

**Deformities of the Palate.**—In connection with the soft palate, bifurcation of the uvula may be mentioned.<sup>1</sup> As regards the hard palate, I have dwelt upon its deformities at some length in an article in the *International Dental Journal* for December, 1895, and the facts there brought forward may be recapitulated as follows:

While the palate occupies but a small place in this great category of hereditary stigmata of all kinds, it is one of the anatomic group, and

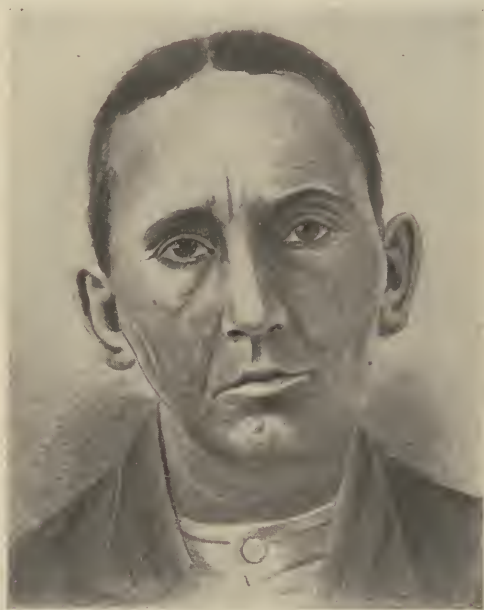


FIG. 191.—Male epileptic, aged forty years, with glabrous face and chin and facial asymmetry.

this group is for many reasons one of the greatest importance. In this group, too, it occupies a distinctive place as being among the most striking, frequent, and significant of the anomalies.

The arch of the hard palate presents considerable variation within strictly normal anatomic limits. A large, wide, moderately high vault is what may be called a normal standard. It means the highest evolution, judging from the fact that the mouth cavity increases in capacity as one ascends the vertebrate series. Deviations from that standard are not at all infrequent, and yet such deviations may be normal. Thus the palate may be low and broad, or it may be high and narrow; it may

<sup>1</sup> Dana, On Deformity and Paralysis of the Uvula, *American Journal of Insanity*, April, 1896.

be short or long in its anteroposterior diameter. It may be ridged unduly along the palatine sutures, or it may present marked rugosities on its surface, especially in the anterior region; yet these variations are normal. Probably these peculiarities are to be regarded as a species of compensatory development. Just as in a study of heads there are some which are very long and low, and others short and round and high, the fact is recognized that the shortness in one dimension is compensated for by a corresponding increase in another; in much the same manner the variations in palatine diameters are to be regarded.

The pathologic palate has not been studied as much as it deserves to be. Save occasional and casual references to the "Gothic" palate in literature, and one or two papers upon the *torus palatinus*, very little has been written upon the subject. In my paper previously referred to



FIG. 192.—Palate with Gothic arch.

I have attempted to classify such pathologic palates as could be justly looked upon as indicative of degeneracy. The word Gothic having been so long in use, and the hard palate being much like an arch or roof,<sup>1</sup> I have followed architectural nomenclature in the classification offered:

Pathologic palates: (1) Palate with Gothic arch. (2) Palate with horseshoe arch. (3) The dome-shaped palate. (4) The flat-roofed palate. (5) The hip-roofed palate. (6) The asymmetric palate. (7) The *torus palatinus*.

The seven varieties named are to be looked upon merely as types. Each type will be found to present variations and combinations with

<sup>1</sup> There is some confusion in literature of the roof of the mouth, or hard palate, referred to in this paper, with the dental arch, which is quite another thing. This is notably the case with some work done by Dr. Walter Channing, of Boston.



other forms. Thus the Gothic arch may have a low or high pitch and be short or long.

The horseshoe arch, a familiar one in Moorish architecture, is always easily distinguished, but, owing to its conformation, a cast cannot well



FIG. 193.—Palate with horseshoe arch.

be taken of it to show it in perfect outline. The dome-shaped palate may be high or low, may be combined with asymmetry or torus. The presence of a torus in the Gothic variety is apt to destroy the purely



FIG. 194.—The dome-shaped palate.

Gothic form, and may cause it to resemble the flat-roofed palate. Under the heading of flat-roofed palate I should include all such palates as are nearly horizontal in outline, as well as those with inclined roof sides

but flattened gable. In the hip-roofed palate there are the sloping sides as usual, but also a marked pitch of the palate roof in front and behind; occasionally one may meet with a palate of this kind with so remark-



FIG. 195.—The flat-roofed palate.

able a pitch from before backward that it is almost like a Gothic roof turned about so that the gable runs transversely. Asymmetry in the

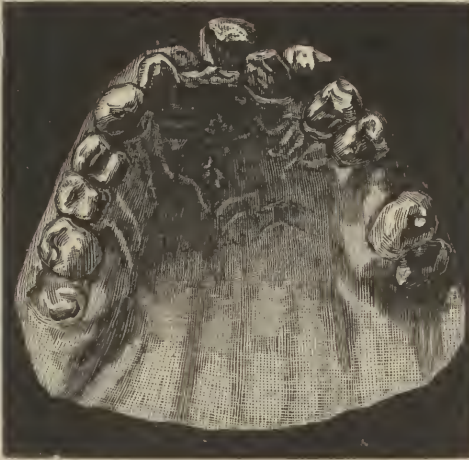


FIG. 196.—The hip-roofed palate.

palate is commonly observed in many of the previously described forms, but occasionally is the only noteworthy peculiarity. It is usual to find asymmetry of the face and skull in cases with an asymmetric palate.

The torus palatinus (Latin *torus*, swelling) was first mentioned by Chassaignac as a mediopalatine exostosis. It is a projecting ridge or swelling along the palatine suture, sometimes in its whole length, sometimes in only a portion of its course. It is always congenital. It varies

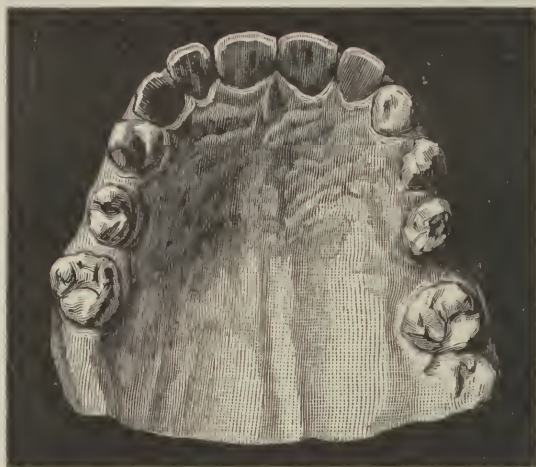


FIG. 197.—The asymmetric palate.

considerably in its shape and size, so that as many as five or six different species of torus are recognized. It may be wedge-shaped, narrow, broad, very prominent, or irregular.

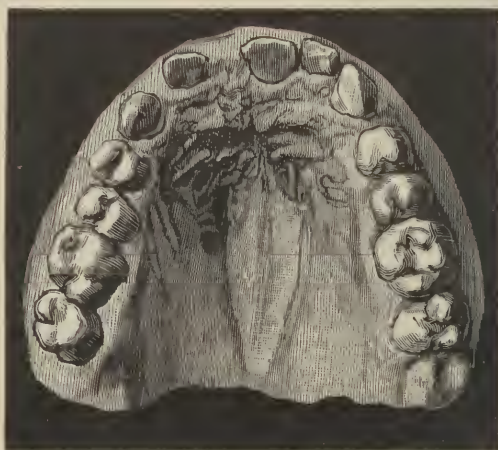


FIG. 198.—Torus palatinus (broad, wide torus).

I have said nothing about cleft-palate, for I am not sure that it may be classed among the well-marked stigmata of degeneration. I have found but 2 or 3 cleft-palates among the 450 idiots and imbeciles on Randall's Island, while a number of cases of this kind with which



I have come in contact in my professional life were very far from degenerates. However, it would seem that there is great need of a faithful study of a large number of cases of cleft-palate in relation to the question of degeneracy. While it is true that from this single indication it would not be strictly scientific to adjudge an individual a degenerate, yet the deformed palate is to my mind one of the chief anatomic stigmata of degeneration. Occasionally perhaps a case presents itself where this anatomic stigma alone would suffice to insure a diagnosis of this nature, but usually other stigmata coexist, such as cranial anomalies, deformities of the ear, and the like. The frequency of the pathologic palate among marked degenerates, such as the insane, idiots, and epileptics, has been testified to by many investigators. Thus, Talbot reported 43 per cent. of abnormal palates in 1605 inmates in institutions for the feeble-minded. Ireland makes it nearer 50 per cent. Charon, a later writer than these, found abnormal palates in 10 per cent. of apparently normal people, in 82 per cent. of idiots and feeble-minded, in 76 per cent. of epileptics, in 80 per cent. of cases of insanity in general, in 70 per cent. of the hysteric insane, and in 35 per cent. of cases of general paralysis. Näcke has studied particularly the torus palatinus in 1449 individuals, normal and psychopathic; he found it present in 23.9 per cent. of psychopathic women (insane, epileptic, idiot, and criminal), 32.9 per cent. of epileptic women, 34.4 per cent. of criminal women, 22.7 per cent. of normal women. The percentages were smaller in men than in women. A narrow torus is more common than a broad one.

Stieda examined 1500 skulls for the torus from an anthropologic point of view. The skulls were of Prussians, Armenians, Africans, Frenchmen, Russians, and Asiatics. He decided that it has no anthropologic significance—gives no racial distinction. While the torus is undoubtedly of value as an index of degeneration, particularly where it is well marked, it probably has less importance in this respect than some of the other forms of pathologic palate.

**Dental Anomalies.**—Among anomalies of the teeth are macrodontism, microdontism, projecting teeth, badly placed or misplaced teeth, double rows of teeth, or teeth which are striated transversely or longitudinally. Caries of the teeth and Hutchinson's teeth are due to neglect or disease. The latter, however, may often be considered as a stigma of degeneration. Another stigma is retardation of the first and second dentition.

**Anomalies of the Tongue and Lips.**—A very large tongue (macroglossus) is not infrequently observed among the lowest classes of degenerates, as in idiocy. Sometimes there is microglossus, asymmetry of the two halves, or bifidity of the point. Harelip is somewhat more common than cleft-palate, but, like the latter, its exact standing as a degenerative stigma is not fully determined. Undue swelling or puffiness of the lips is noteworthy.

**Anomalies of the Nose.**—Marked deviation of the nose to one side or the other should be noted. Taken alone, it may possess little significance, but in conjunction with other stigmata it has value. The

nose may be absent, or present defect of osseous development (*nasus aduncus*) or atresia of the nasal fossæ.

**Anomalies of the Eye.**—The pathologic conditions of the eye have been placed in two groups in the following classification, since some are anatomic and some physiologic. To enumerate them altogether, they are as follows:

<i>Anatomic.</i>	<i>Physiologic.</i>
Flecks on the iris.	Blindness.
Chromatic asymmetry of the iris.	Hypermetropia.
Strabismus.	Myopia.
Narrow palpebral fissures.	Astigmatism.
Congenital cataracts.	Daltonism.
Albinism.	Concentric limitation of the visual field.
Pigmentary retinitis.	Hemeralopia.
Muscular insufficiency.	Nystagmus.
Microphthalmos.	

It is true that any one or two or more of these conditions present do not certainly indicate degeneracy, but they are significant in connection with other abnormal states, and all are more frequently observed in degenerate individuals, especially the lower orders, than in normal persons. In idiots convergent strabismus, due to defect of refraction and in conjunction with hypermetropia, is very common. Muscular insufficiency and nystagmus, lateral or rotary, are also often met with in this class of cases. In paralytic and other idiots and imbeciles homonymous hemianopsia is sometimes met with.

**Anomalies of the Ear.**—Deformities of the ear have been deservedly well studied, for as stigmata of degeneration they take high rank, like anomalies of the hard palate, in the anatomic group. Morel, Stahl, Wildermuth, Binder, and, more recently, Schwalbe have given us especially good studies of these conditions. From their writings and my own studies the following classification (following Binder) into twenty-two varieties may be made:

1. Abnormally implanted ears: they project too far or lie too closely, are placed too high or too low, too far forward or too far backward, on the head.

2. Excessively large ears: (1) absolutely too large; (2) relatively too large in small or microcephalic individuals.

3. Ears which are too small.

4. Too marked conchoidal shape of the ear. The details of the ear (anthelix and crura, etc.) are but slightly marked, while the helix outlines the ear like the rim of a funnel.

5. Ears which have a general ugly shape. The breadth of the upper part may exceed that of the lower, and vice versa; excessive length; ears without lobules; unusually short ears.

6. The ear not uniform in width: usually a long ear with one or more constrictions in its breadth.

7. The Blainville ear; asymmetry of various kinds of the two ears. In most cases the asymmetry is due to an anomaly of the left ear.

8. The ear without lobule; there are usually other deformities of

this ear besides the absence of lobule, such as too large a concha, prominence of the anthelix, etc.

9. The ear with adherent lobule; the lobule is enlarged, adherent, and inclines downward toward the cheek.



FIG. 199.—Abnormal implantation of ears; too marked conchoidal shape. The Morel ear.

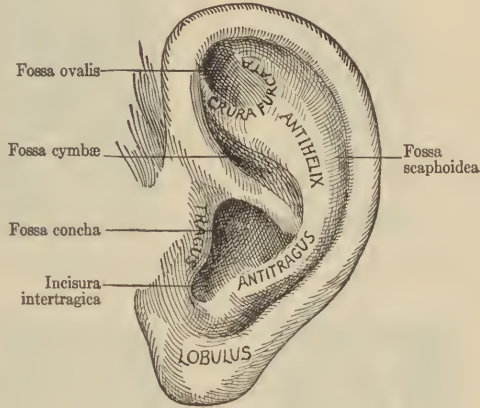


FIG. 200.—Normal ear.

10. The Stahl ear No. 1.<sup>1</sup> A series of anomalies of the helix. The helix is broad like a band, and coalesces with the cartilages of the crura furcata. The fossa ovalis and fossa scaphoidea are scarcely to be seen.



FIG. 201.—Excessive length of ears; facial asymmetry.



FIG. 202.—Blainville ear; also excessive length of ears.

The lower half of the helix is obliterated. There are occasionally slight variations from this type.

<sup>1</sup> Archiv für Psychiatrie, vol. xvi.



11. The Darwin ear; helix interrupted where its transverse portion passes into descending, and at this point is a projection of the rim above and outward, like the pointed ear of lower animals.



FIG. 203.—Stahl ear No. 1: elephant ear.



FIG. 204.—Darwin ear in an epileptic.



FIG. 205.—Broad, band-like helix; no anthelix; no lobule; excessive size of fossa cymbæ.



FIG. 206.—Excessive length of ear; fusion and distortion of helix, anthelix, antitragus, and lobule.



FIG. 207.—Triplication of crura furcata; malformed helix and antitragus; absent lobule.

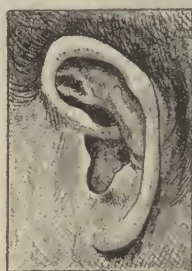


FIG. 208.—Fissure in anthelix; slight Darwin tubercle; slight antitragus.



FIG. 209.—No crus superius; no anthelix; small fossa conchæ; few details of ear.

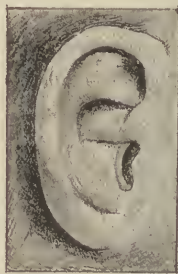


FIG. 210.—No lobule; no fossa conchæ; shallow fossa scaphoidea; fusion of helix, anthelix, and antitragus; a type of Stahl ear No. 3.



FIG. 211.—Prominent anthelix; maldeveloped helix; absence of lobule; diminution of the concha; Wildermuth ear No. 1.

12. The Wildermuth ear.<sup>1</sup> The anthelix projects so far as to form the most prominent part of the auricle.

13. The ear without anthelix or crura furcata.

14. The Stahl ear No. 2. Multiplication of the divisions of the crura furcata, so that there are three instead of two crura.

<sup>1</sup> Wurtemburger Correspondenzblatt, 1886, No. 40.

15. Wildermuth's Aztec ear. Lobule wanting; the whole ear seems pushed forward and downward; the crus superius of the anthelix coalesces with the helix, while its crus anterius is scarcely perceptible.

16. The Stahl ear No. 3. Only the crus anterius of the crura furcata is present, while the auricle seems divided into two halves by a ridge from the antitragus.

17. The ear with double helix.

18. The ear with too large or too small a concha.

19. The ear with continuous fossa scaphoidea. The fossa passes down into the lobe.

20. The Morel ear. A form marked by abnormal development of the helix, anthelix, fossa scaphoidea, and crura furcata, so that the folds of the ear seem obliterated, and the ear is smooth, larger than usual, often prominent, and with thin edge.

21. Ears misshapen by abnormal cartilage development. Here belong all irregular cartilaginous growths and thickenings except those caused by hematoma of the ear.

22. Various peculiarities, difficult to classify, are included here, such as abnormalities of the semilunar incisure of the tragus and of the meatus, coloboma of the lobule, hairiness of the different parts of the auricle, accessory ears, clefts, etc.

The most important malformations of the ear, those that may be regarded as belonging to the stigmata of degeneration, and those too which are striking and plain to the eye, are to be summarized as follows: The deep position of the crus anterius; marked prominence of the anthelix; excessive broadening of the ear; stunted development of or absence of the helix; trifurcation of the anthelix; widening of the crus superius; absence of the crus superius; complete absence of lobule; asymmetry of the two ears; excessive enlargement or diminution of the concha; excessive conchoidal structure of the ear.

Reference is occasionally made in literature to the Cagot ear. The Cagot is a species of cretin in the French and Spanish Pyrenees, in which one of the chief physical deformities is absence of the lobule of the ear.

Binder states that the adherent lobule exists in almost one-third of normal people, and in the photographs of several hundred distinguished people, 15 per cent. had abnormal lobules. At the same time more than twice as many adherent lobules are found in degenerates as in normal people.

With regard to the statistics of malformed ears in degenerate individuals: Wildermuth noted this condition in 41 per cent. of 142 idiots. Binder found 64 per cent. of degenerate ears in 354 insane people. It is to be remarked, however, that Binder was more careful in his examinations, and by long practice had acquired more expert knowledge than Wildermuth. Fränkel observed degenerate ears in 29 cases out of 32 with cranium proganæum.

Knecht found 20 per cent. of degenerate ears among 1274 criminals, 27 per cent. among 48 epileptics, and 32 per cent. among 84 insane.

Binder noted degenerate ears in 33 persons outside of institutions supposed to be normal individuals. Inquiring closely into their histories, he discovered that 7 of them had insane parents, brethren, or children; in 19 there were decided psychic abnormalities; and only 7 were apparently normal people. As regards heredity, it is very common for children to inherit ears with the identical characteristics of those of one or the other parent, but, on the other hand, it is not uncommon for the ears of children to be quite different.

**Anomalies of the Limbs.**—Paralysis, atrophy, retarded growth, club-foot, and athetosis are conditions due to disease of the brain, and are observed in many cases of paralytic idiocy. These are not properly stigmata of degeneration, although they may be such under some circumstances—as, for instance, when



FIG. 212.—Phocomelous right arm in epileptic girl; right humerus several inches shorter than left; arms otherwise perfect.

club-foot or club-hand has a teratologic origin. On the other hand, there are anomalies having a hereditary character which are essentially degenerative indices. Among these may be mentioned congenital luxations, supernumerary fingers or toes (polydactyly), fusion of fingers or toes (syndactyly or aschistodactyly), excessive length of the arms as compared with the remainder of the body and the lower limbs, missing fingers or toes (ectrodactyly), missing limb (ectromelus), fusion of the extremities (symelus or symmelus), or absence of parts of limbs so that they are excessively short (phocomelus). There may also be anomalous brevity of some digits as compared with the relative proportions of normal digits. Excessive volume of limbs (megalomelus) or of digits

(megalodactyly), or excessive gracility of limbs (oligomelus) or of digits (oligodactyly) also deserves mention.

**Anomalies of the Body in General.**—Local malformations are naturally of more importance than general anomalies of the whole form, but it is necessary to study the relative proportions of the entire figure from an anthropometric point of view and to compare the results with normal standards. Excessive diminution of stature as well as excessive or giant growth is indicative of degeneracy. So, too, are infantile characteristics in an adult, feminine peculiarities in males, and masculine traits in females. In this regard observations of the relative proportions of the shoulders and pelvis are particularly useful. The occult form of spina bifida with local hypertrichosis is met with. Deviation of the vertebral column among neuropaths is mentioned by Feré. They may



be lordoses, scolioses, or kyphoses in various degrees. The coccyx may present peculiarities, such as simulation of a tail. Thoracic asymmetry or other deformity is observed at times. Absence of pectoral muscles or of muscles in various parts of the body has significance. Hernias are evidence sometimes of arrest of development of some part of the abdominal wall. Excessive development of mammary glands in males, or their absence or reduplication (polymastia) in either sex, constitutes an evidence of degeneracy.

**Anomalies of the Genital Organs.**—Among the genital anomalies in males are cryptorchidism; unilateral or bilateral microrchidia; spurious hermaphroditism; insufficient development of the entire genital apparatus; hypospadias; epispadias; defect, torsion, or great volume of the prepuce; median fissure of the scrotum; imperforate meatus.

In females the labia may be abnormally large, simulating a scrotum; sometimes very small. The labia minora may be hypertrophied. The clitoris may be exceedingly large. Sometimes there are intermediate folds between the labia minora and labia majora. The labia minora may be pigmented, particularly in brunettes and when they are hypertrophic. There may be imperforate vulva, atresia of the vagina, or double vagina; uterus bicornis is sometimes found.

Anomalies of the genito-urinary apparatus should always be sought for, for, though most frequent among idiots, imbeciles, epileptics, and the like, they are by no means rare in other classes of degenerates and in degenerate families.

In males defects of the testicles often coincide with general excess of growth in the whole body or in the lower extremities, such as is often produced by castration in men and lower animals.

**Anomalies of the Skin.**—Among the anomalies of the skin are to be mentioned adipose thickening; polysarcia; precocious and often abnormal development of the hairy system; hair along the spinal column; rudimentary tail; premature grayness; a glabrous chin in grown men; persistent lanuginous character of the hair; excessive growth of hair on the chin and breasts in women; complete or partial decoloration of the hair (albinism, vitiligo); local or general hypertrichosis; partial or complete absence or fetal state of the nails; pigmentary or vascular nevi; melanism of the skin; molluscum; vitiligo; ichthyosis; pigmented spots; albinism.

**Anomalies of Motor Function.**—Delay in acquiring a knowledge of the proper use of muscles for walking, eating, and the like may often



FIG. 213.—Hypertrichosis in a female imbecile, aged thirty years.

justly be regarded as an index of degeneracy. When ordinary etiologic factors may be excluded, tremors, tics, epilepsy, and nystagmus have a similar value. Even when not congenital, they often indicate hereditary instability of the nervous system.

**Anomalies of Sensory Function.**—The numerous anomalies of function in connection with the eye have already been mentioned. Congenital deafness has also its significance. So, too, have hereditary forms of migraine and neuralgia. Certain defects or excesses in general cutaneous sensibility have been noted as frequent among degenerates. In some instances there is hyperesthesia. A general anesthesia is not uncommon, especially among the lower classes of degenerates.

**Anomalies of Speech.**—It may be questioned as to how far stammering and stuttering are to be looked upon as functional degenerative stigmata, but they are certainly found more often in children with a neuropathic inheritance than in children with good heredity. Delay in the acquisition of language or complete or partial defect of speech has more significance.

**Anomalies of Genito-urinary Function.**—Sexual irritation, impotence, sterility, and urinary incontinence must be considered as indices of a neuropathic disposition. Retardation of puberty in both sexes, but especially in the male sex, is a noteworthy indication.

**Anomalies of Instinct or Appetite.**—It has been pointed out that among all degenerates there is a taste or appetite for certain foods or drugs which tends to favor their dissolution (alcohol, morphin, cocaine, and the like). In many cases of inebriety the uncontrollable appetite is to be looked upon as a functional stigma of neuropathic inheritance. Gluttony, merycism, and the like are usually similar indications.

**Miscellaneous.**—A diminished resistance against external influences, such as strains of various kinds, and diseases is significant. Great precocity of intellectual development and of certain aptitudes and morbid emotional conditions are among suspicious indications of a neuropathic basis.

**Psychic Stigmata.**—Some of these have already been enumerated. The most important of the psychic stigmata is mental weakness, and this condition will practically always be found in association with significant anatomic or physiologic stigmata, and it may be present (usually as an acquired condition) when these other objective stigmata are absent. While mental weakness is generally apparent to the examiner without elaborate tests, the degree of retardation or defect is determined accurately by the series of intelligence tests described elsewhere in this book (see chapter on Idiocy, Imbecility, and Feeble-mindedness).

#### THE MEDICOLEGAL VALUE OF DEGENERATIVE STIGMATA

The values of the stigmata just described vary much as regards their significance in the diagnosis of the condition of degeneracy. The physician would be apt to attach an importance to some of them in connection with cases coming before him in ordinary practice which he would

hesitate to certify as absolutely unquestionable in cases where serious legal decisions hang upon his testimony. For instance, the sensory anomalies of the eye possess less significance than the anomalies of instinct or appetite, and these again less than malformations of the head, palate, or ear. Indeed, all the anomalies of common physiologic functions are of less importance than the anatomic stigmata. There being also variation in the degree of morbid deviation from the normal, the value of the deductions made from the examination of the patient must depend upon the experience and judgment of the examiner. As regards the relative values of the stigmata enumerated, I am tempted to classify them somewhat as follows:

<i>First Degree.</i>	<i>Second Degree.</i>	<i>Third Degree.</i>
Cranial deformities.	Facial asymmetry.	Anomalies of the tongue and lips.
Palatal.	Dental anomalies.	Sensory anomalies.
Deformities of the ear.	Anomalies of the nose.	Anomalies of motor function.
Malformations of the limbs.	Anatomic anomalies of the eyes.	Anomalies of speech.
Anomalies of the body in general.	Anomalies of the skin.	
Anomalies of the genital organs.	Anomalies of instinct or appetite.	Anomalies of genito-urinary function.
Psychic stigmata.		

Now, while one or two anomalies of the first degree might be absolutely significant of marked degeneracy, two or three of the second degree and four or five of the third degree might be essential to an impartial and certain decision in the present status of the science of criminal anthropology.<sup>1</sup>

<sup>1</sup> For references not made in the text see: Altabas, Visual Defects in Idiots, Medical Press and Circular, 1895, p. 234; Binder, Arch. f. Psych., Bd. xx, S. 514; Calori, Sull' anat. del palato dura, Bologna, 1892; Channing, New York Med. Rec., Oct. 3, 1891; Charon, Thèse de Paris, July 2, 1891; Clouston, The Neuroses of Development, 1894; Feré, La famille neuropathique, Paris, 1894; Fraenkel, Allg. Zeit. f. Psych., Bd. xxxvi; Knecht, Ibid., vol. xl; Minot, Embryology; Morel, Traité des dégénérescences; Näcke, Arch. f. Psych., Bd. xxv, 1893; Schwalbe, Ibid., 1895, xxxvii, 633; Stieda, Internationale Beiträge zur wissenschaft. Med., Bd. i; Talbot, Quoted by Farrer in Irregularities of the Teeth, New York, 1888; Voisin, L'Idiotie, Paris, 1893; Waldeyer, Ueber den harten Gaumen, Corr. Blatt der Deutsch. Anthropol. Gesellschaft, 1892.



# MENTAL DISORDERS IN MEDICOLEGAL RELATIONS

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## INTRODUCTION

MENTAL disorders in their medicolegal relations are beginning to command a far wider range of interest than is included in the relations they have had to what is legally regarded as insanity.

The results of the observation of delinquents, criminals, and socially inadequate individuals that come before the courts has abundantly shown the great frequency with which mental abnormalities occur among these classes, and there is a growing conviction that a proper attitude toward offenders against the laws and their efficient treatment may best be obtained by an appreciation of their underlying mental problems.

Mental disorders have medicolegal relations by reason of their influence on conduct and behavior. As the source of all conduct, whether normal or abnormal, is in the functional activity of the mind, alterations of this from its normal or usual workings tend to change the individual in his social relationships. The effects of this may be such as lead to actions and expressions that are harmful to others or violate legal regulations. In these situations mental disorders become problems that must interest the courts and administrators of the laws.

Individual man, in his legal relations, is a member of a social group that has, during its evolution, found it essential to prescribe certain customs and regulations in order to promote the welfare of the group, to provide for its orderly regulation, and to assure safety for life and property. Whatever laws have been made have been formulated upon the view that the normal and healthy man has sufficient strength of will to resist impulses to actions that are punishable, and is able to act with a general appreciation of his rightful relations to others.

An individual in possession of these qualities is regarded by the law as sane and is responsible for his expressions and conduct. When the mind is incapable of performing its functions according to normal standards by reason of a defect or disease, and as a result the understanding of the individual of his relations to others and to his environment is abolished or impaired, and normal control of his conduct is lost, then the individual is to be regarded as insane.

Sane and insane are terms that are legal and social in their application. They are founded on legal decisions and their determination is a matter of legal and not medical procedure. The fact that legal insanity is the result of mental disease makes the problem of the determination

of the existence or non-existence of disease one that is essentially medical in its nature and one in which medical science must aid the court.

While all insanity is the result of mental disease, not all mental disease constitutes insanity in its legal meaning. The law regards sanity and insanity as two absolutely contrasting states. A man must be either sane or insane. With this position the physician finds it difficult to agree. Medical experience with problems of mental disorders has amply shown that there exists a wide and varying range between sanity and insanity. The transitions from normal to abnormal, from sane to insane, are changeable and indefinite, and insanity, like any other disease, is a relative matter and surrounded by no sharp demarcation.

Even when the transition seems objectively to be abrupt and sudden, there commonly lies back of this period an interweaving of normal and abnormal, of healthy and pathologic mental functioning, that reaches back into the earliest phases of the beginning of the personality of the individual and that leads directly or indirectly to the culmination that marks the objective breakdown. When the individual because of disease of mind is no longer able to adjust his reasoning and conduct to the requirements of his social group the law regards him as one alienated in mind or insane.

It is quite generally felt by those interested in problems of mental disorders in their medical and sociologic relations that the rigid provisions that the law has for dealing with an individual in respect to his actions do not give adequate consideration to the complexity of the mechanisms that enter into conduct and behavior.

The nature of the problem involved in giving an exact statement as to the subjective mental state of an individual at a particular moment is obviously one that cannot be answered by any degree of scientific certainty. It is usually possible from available evidence to be certain as to the existence or non-existence of disease or the effects of this, but to state whether the degree and quality of this disease abolished or impaired the capacity to reason as to the nature and consequences of an act, or whether it excluded free choice of action, or abolished the normal control of impulses to harmful actions must be impossible and would be an opinion open to controversy and debate.

To require from the physician answers to questions so sharply limited in their scope as the law now provides is unfair and often fails to give any adequate understanding of the personality of the individual. Within the field between normal and abnormal exist mental states that frequently lead to infractions of the law which do not conform to the rigid requirements of legal insanity and are not recognized by the law as relieving of responsibility. Some of these are transient in their occurrence, such as the episodic mental disturbances among the psychoneuroses and abnormal personalities; others, more permanent, are pathologic distortions of personal beliefs in regard to the realities of their environment and relations to others that definitely prevent the individual from reasoning and acting in normal ways. These are not generally recognized by the law as insanity or as always excusing the act

of an individual, but yet are pathologic disorders of mind seriously disabling normal social relations.

While these may not relieve the individual from some measure of responsibility, they should be given consideration in deciding as to punishment or treatment, or of judging as to mental capacity for civil responsibilities. Individuals with these disorders have a distinctly different status from those who are free from such abnormalities.

It is in dealing with the effects of the feelings and emotions, the affective states, that medical science finds it difficult to adjust its views to legal demands in respect to their influence on personal responsibility. At the moment of an act of which an individual may be accused his character has already been determined. This character is the result of affective forces that have been gradually giving it shape throughout the entire development of the personality. So that when the stimulus, the incentive to action, is received the act has already been determined.

It is affective influences that determine the will of the individual, and in this respect the fundamental viewpoint of the law that there exists a freedom of will that must be regarded as determining a choice of action is not in agreement with the views of scientific experience. There can be no effect without a cause, and back of the moment of decision there is the determining influence of affective forces that lie in great part entirely outside of the power of the individual to select or avoid.

The balancing of motives for or against an action is a struggle between feelings and impulses that have become more or less fixed by habit in the character of the individual. These affective forces in large part have their source in instinctive cravings and needs for emotional outlets that are an inherent part of the individual's inheritance in his biologic evolution, or have their basis in organic functioning of the physical structures of the body. Their shaping influence upon character has been subtle and in large part unconscious. Efforts to secure relief from affect tensions that are unbearable by the personality easily leads to the formation of bad traits of character or lack of development of normal inhibition that are in direct relation with conduct that frequently becomes a problem with which courts must deal. At the moment when a course of action is chosen it seems as if there was experienced a sensation, or change in the psychologic setting, that makes it appear as if a free and spontaneous course of action were being undertaken. The more closely this is analyzed, the more does it become apparent that there are forces lying back of this and the less does the action appear to be one of free choice.

It is with this standpoint of the law in respect to freedom of will and the lack of uniformity in the personalities of individuals as they stand before the courts accused of crime, that the conceptions of the psychiatric problems involved in a given forensic case are viewed differently by the physician and jurist.

The physician must interpret to the jury the problem as he views it from the standpoint of medical science. But too often the formalities of procedure make it impossible to convey to the minds of the jury this



medical conception. When the disorder of the individual is clearly enough defined in its symptoms to permit of designation by the name of some formal classification this difficulty is less, but in a considerable number of psychiatric problems this is not possible. It is not solely from the need of a more humane and just consideration of the individual that a better psychiatric appreciation of the individuals who are offenders against the law is necessary nor to relieve them of proper treatment, but chiefly from the desirability of giving society a better protection and to bring into the law the results of scientific advances in knowledge of the forces controlling and influencing conduct.

It is true that in the development of any field of knowledge much must remain for a time uncertain and controversial. This is especially true in the field of psychiatry where the nature of the material that must be dealt with does not lend itself to the methods of experimentation and proof that exist in other branches of science. Nevertheless psychiatry has made great advances within recent years, especially in its knowledge of the influence of disorders of mind in problems of behavior and in the pathology of the nervous system, that so frequently lies back of the disturbances of function that show as symptoms of mental disease. These developments have had little or no influence upon the theories and administration of the laws dealing with human conduct.

The physician acting as aid to the court in deciding as to the presence or absence of mental disease must take the law as it exists, but his answers to questions put to him must be in agreement with medical experience.

## GENERAL SYMPTOMATOLOGY

### DISORDERS OF PERCEPTION (ILLUSIONS; HALLUCINATIONS)

The beginnings of mental function are in the conscious recognition of the effects of a stimulus acting upon the special sense organs or upon end organs of the nervous system widely distributed throughout the body for the reception of sensory impressions. The material so received is utilized in the further mental processes of memory, thinking, and the formation of conclusions or judgments. A correct understanding of the world about us and of our own body is only possible if these perceptions correspond with realities.

Normally there exist more or less well-marked individual differences in the accuracy of perception that may have a practical bearing on forensic problems. Individuals describing the same object or situation may give quite varying accounts of details of these. Witnesses to situations and acts of legal importance may give testimony that they truthfully believe is accurate and yet varies from reality. This has been abundantly shown by psychologic experiments and is well known from experiences in court. Accuracy of perception may be impaired by defects of vision, by color blindness, by disorders of hearing or of the special senses, and the memories of experiences might not be in agreement with facts.

The absence of perception in a special sense field by reason of disease or defect may have a forensic importance in its influence upon the intellectual development of an individual, but while a considerable number of the blind, deaf, and dumb are feeble-minded, such defects do not always insure lack of intelligence. Many individuals with these defects acquire intelligence equal to normal or even superior to the average by reason of intensive training of other sense fields. The cases of Laura Bridgeman and Helen Keller stand out as interesting examples of this.

Disturbances of sense perception from disease of nerve structures that conduct stimuli from the periphery to the central nervous system, such as peripheral neuritis or disease of the sensory tracts of the cord, may result in diminished or absent perception or in an increased sensitiveness to special sense qualities. Apart from the diagnostic value of these in some nervous disorders accompanied by psychic disturbances, such as general paresis, alcoholic and toxic forms of neuritis, they have little forensic importance.

In normal individuals disturbances of sensation have no permanent influence on further mental functioning, as they are considered in reasonable ways and do not produce distortions of realities. It is when perceptions are not in harmony with realities and are not corrected that they have serious consequences. The two most frequently observed instances of this are illusions and hallucinations. While the distinctions between these are often difficult of differentiation, it is generally held that an illusion is a falsified perception that results from an actual stimulus and an hallucination is a sense perception without an actual stimulus. It is an illusion where the individual perceives a spot on the wall or floor or any object or sense experience as something else than it really is. Commonly these have a terrifying or unpleasant quality. In the visual field it is common for the object to be perceived as if it were an insect or animal, in the field of hearing actual voices may be regarded as music or making insulting remarks. In the field of smell and taste real sensations may become distorted into unpleasant perceptions of disgusting substances or poisons. Illusions may be of more or less normal occurrence and are then usually explainable as being due to inattention or fatigue and their correction gives them little or no further pathologic mental effects. Their pathologic occurrence is most frequently observed in states of unclear consciousness and the delirium often associated with febrile conditions. Their presence may lead to fears and apprehensive agitation or they may determine the contents of delusions. Usually their effects pass off with cessation of the physical illness with which they are associated, but in other instances they leave residual memories that may have permanent influences upon further mental functioning.

Hallucinations, like illusions, may occur in any of the fields of sensibility. Not infrequently hallucinations may occur in several fields in the same psychosis. They are most frequently observed in the auditory and visual fields, somewhat less as hallucinations of smell and

taste, and rarely of the tactile and muscle sense. Of the various types of hallucinations those of hearing are the most serious in their effects upon mental activities, probably, as Kraepelin states, because of the important part that auditory language has in processes of thought.

They occur in a wide range of complexity from unelaborated impression of light flashes, ill-defined noises, simple sensations to the most complex scenes, situations, or conversations. The more simple or elementary hallucinations are most frequently met with in relation with some abnormality of the peripheral sensory apparatus or in increased sensitiveness of the central sensory receiving areas of the brain cortex.

Hallucinations of the visual field occur as objects of simple or complex qualities, such as animals, persons, religious or terrifying scenes, or elaborate situations. In the auditory field they are commonly perceived as isolated words, voices, or noises. They hear their name spoken in conversations or are troubled by unpleasant commands or terrifying threats. Hallucinations of smell or taste are experienced as various odors or tastes of unpleasant or disgusting quality.

A characteristic feature of hallucinations is their vividness to the patient and their accepted reality. In acute psychoses and in the early phases of those of more chronic course they have a strong emotional emphasis that compels attention. As deterioration progresses this emotional influence may be lost and the patient be indifferent or even pleased at their presence.

As to the psychologic causes of hallucinations there is little known. They have an intimate relation to the emotional attitude and their content is often determined by the fears, wishes, and mental interests of the patient. While to the observer their content harmonizes with the thoughts of the patient, this relationship is seldom recognized by him, and their strangeness and seeming foreignness to his own lines of thought leads to their being referred to outside forces.

The explanation given by those hallucinated as to the source of their disturbances depends much upon the intelligence and their interest in the experiences. It is common to refer their cause to objects and forces that have an element of the mysterious. They are referred to electric influences, wireless telegraphy, *x*-rays, hypnotism, or spiritual forces, etc.

It is often a matter of difficulty and uncertainty to differentiate between what is a vivid thought of the patient and what are hallucinations. In most instances this is not of practical significance, as hallucinations rarely occur as isolated phenomena and are but one among other pathologic features of a psychotic disorder. Attention and distraction have an important influence on the occurrence of hallucinations. They are facilitated by the shutting off of usual sensory stimuli and occur with special frequency in the quiet of the night or in the darkness or stillness of isolation in confinement in jails or hospitals.

The content of hallucinations in the early phases of a psychosis while lacking a normal agreement with realities often has a plausible quality, but as deterioration advances this may become absurd and phantastic. In some psychoses the hallucinations are more or less



specific in their type. In delirium tremens they commonly take the form of animals, insects, snakes, and terrifying creatures. In the sub-acute and chronic forms of alcoholic psychoses the hallucinations are largely in the auditory field. They occur as voices, conversations involving the patient, or as insulting remarks. In the delirium from the chronic use of cocaine the hallucinations are chiefly visual, and what is seen is usually small in size, such as small holes in the wall, or minute insects or objects on their body. In dementia præcox hallucinations are pre-eminently in the auditory field and occur as voices, commands, conversations or remarks which express their wishes or fears. Where tactile hallucinations occur they are described as electric shocks or magnetic forces acting upon their body. In epilepsy they are both auditory and visual and have a characteristic terrifying or ecstatic religious quality. In hysteria the hallucinations largely represent wishes or fears or ecstatic experiences. In the acute psychotic disturbances met with among prisoners confined in jails the hallucinations take their content from the trying situation they are experiencing. Voices express their wishes or fears, or they hear conversation in which they are exonerated from their alleged guilt. The diagnosis of hallucinations is often facilitated by the attitude and actions of the patient. Their facial expression often shows an appearance as if listening or frightened or pleased by what they see or hear. Sometimes they stop or cover their ears to prevent hearing the troublesome voices. It is often easy to get direct information from the patient, who may frankly tell of being troubled by hearing voices or noises or seeing or tasting things that are unusual. Not infrequently the hallucinated person complains to the police of his annoyances and seeks protection or goes directly to those whom he regards as responsible for his troubles.

In other instances the suspicions of the patient may cause him to dissimulate or deny their existence, and their detection may be a matter of much difficulty or uncertainty.

The forensic significance of hallucinations lies largely in the imperative and compelling force they have upon actions of the individual, and their influence in producing unreal conceptions of persons and objects of his environment.

Conduct harmful to others is sometimes the direct result of voices that command the carrying out of some action, or threats when these annoyances can no longer be withstood. When hallucinations are present in association with other evidences of a psychotic disorder it is not necessary to show the direct connection of the hallucinations with an action in question. The existence of disordered perceptions indicates a mental state that makes knowledge of right and wrong obviously different from that of the normal man.

The harmful acts resulting from visual hallucinations that occur in delirium tremens and in epileptic insanity are in association with an unclear state of consciousness that excludes the capacity to reason correctly regarding the act. They occur usually as results of marked anxiety and fears for their own safety.

Hallucinations of smell or taste are usually unpleasant and form the basis for the development of delusions of influence or persecution.

Hallucinations are commonly so intermixed with delusions that they have a mutually supporting influence in forming abnormal conceptions of reality. In this way hallucinations are sometimes the basis for hypochondriac delusions of disease or injury that lead to legal action or attacks against their physicians or nurses.

Abnormal sense perceptions referred to the sexual organs sometimes lead to delusions of sexual assaults or illegal sexual acts. These not infrequently occur following narcosis or in hysteric disorders of consciousness, and may lead to false accusations.

## DISORDERS OF CONSCIOUSNESS

In order that the stimuli coming to the nervous system may be transformed into psychic material, such as perceptions and ideas, and that ideas formed from the memories of past experiences may be associated together in the processes of thinking, it is essential that there exists the mental state that has been designated as consciousness. When this is not present no psychic activity is possible. In the development of psychic life there early comes a phase in which psychic activities come into relation with a feeling that the events that are taking place within the mind are a personal possession. The relationship that is then formed becomes the "self" or "ego" or the personality.

Consciousness involves the act of self becoming aware of what is taking place within the mind. Ideas and perceptions that are formed in consciousness are continually being replaced by others that come and go; thus, consciousness is continually changing. That which has been active in consciousness is not lost as it passes out, but remains as a fund of material in the form of memories that can again be drawn into consciousness. Distinctions thus exist between consciousness as an active process, and a content of consciousness, that is composed of the material that has been active in consciousness in previous times. Whether or not one becomes conscious of a stimulus, either in the form of a new perception or an idea previously formed, depends upon the strength of the stimulus and whether or not the state of consciousness was normal at the time the stimulus was active. Much that is continually coming to the nervous system never reaches consciousness, either because the stimulating influence is too feeble to hold the attention, or because it is not in harmony with the emotional qualities dominating consciousness while it was acting. Thus, much that is experienced is easily forgotten or at least cannot readily be recalled into consciousness.

That which is feebly imprinted in consciousness is not able to form any extended associative relations with the material that lies latent and thus is difficult to reawaken in the usual course of thinking. As a rule this can be recalled when the associations of which they were originally a part are presented. One often observes how memories of names and details that have long been forgotten are revived when specially favor-

able associative relations are provided. Whether or not memories of experiences remain available for use in consciousness depends much on whether they are matters that may be unpleasant or disagreeable to the personality. Experience shows that such ideas and feelings may be kept away from conscious recall through the mechanisms of repression. In this way may be explained the amnesias and forgetfulness that occurs in hysteric individuals and those that have encountered experiences that are of unusual emotional intensity.

These ideas are not lost, but continue to exist in those regions or fields that are designated as "the unconscious" or "the subconscious." While they cannot be recalled through usual processes of association they are capable of exerting an influence upon the action of consciousness. Their effects can be seen upon the choice of ideas that enter into consciousness and their affective influences may disturb the normal lucidity of consciousness even to its complete abolishment. Their influence upon actions may account for acts that are carried out without the individual being conscious of any motive that determined the action. These occur as impulsive and automatic actions and in outbursts of anger and acts of an aggressive character in which the energy shown is out of all proportion to the demands of the situation.

Disorders of consciousness may influence the quality of the material that is preserved as memories. Normally memories must agree with realities. If perceptions and ideas are not clearly presented in consciousness, they may pass out in a form that has no agreement with what was real. There thus accumulates a material that, when utilized in the processes of thinking, may form the basis for delusions and pathologic mental attitudes.

In forensic relations disorders of consciousness are chiefly of interest as they pathologically change the normal clearness of consciousness and as they produce changed states of consciousness. Unless consciousness has a normal degree of clearness the individual lacks the normal capacity to acquire a correct understanding of a situation and to utilize his accumulated experiences to determine his actions in correct ways. Between unconsciousness and normal clearness of consciousness there are varying degrees of depth of disturbance.

Complete unconsciousness exists when all evidences of psychic activity is abolished. Stimuli coming to the nervous system produce no perceptions and the capacity to think and act is totally lost. Clinically this occurs in the form of syncope and fainting attacks from physical disturbances such as failure of heart action, loss of blood or shutting off the cerebral circulation, or from cerebral disturbances produced by falls or blows upon the head. It may be caused by the effects of narcotics and toxic substances such as chloroform, alcohol, and intoxication from drugs. It occurs from the effects of toxic substances formed within the body as in the coma of diabetes or uremic poisoning. It may be the result of changed circulatory relations within the brain, as in cerebral hemorrhage and thrombosis. Attacks of complete unconsciousness occur in relation with the severe convulsions of epilepsy and in some of the



organic disorders of the nervous system, such as general paresis, cerebral syphilis, and tumors of the brain. The unconsciousness may come on suddenly or it may be the termination of a gradual obscuration of the clearness of consciousness as in the unconsciousness from drugs and toxic influences. In complete unconsciousness all actions are abolished except as they occur as movements in convulsive attacks. The forensic significance of these must be slight, although it is conceivable that they may have harmful effects as when in accidental ways they may cause fires or some one nearby may suffer personal injury.

More important in forensic relations are those disorders of consciousness that are designated unclear or befogged states of consciousness. These may result from a variety of causes. Some of these are psychogenic, resulting from the pathologic action of affective influences such as the various disorders of consciousness after emotional disturbances and the abnormal states present in hysteria and the dissociated states of consciousness. Others are the direct result of the influence of toxic agents or disease processes upon the central nervous system, while others may follow traumatic injuries to the head.

They may occur as phases preceding or following complete loss of consciousness, or as accompaniments of febrile or infectious diseases. They may be the result of poisons taken into the body or formed within the body during some physical disease. They may be conditions occurring in well-defined psychoses. They are frequent clinical occurrences in epilepsy and hysteria.

The disorder of psychic functioning in these states varies with the depth of the disturbance. The common features are an impairment of the capacity to respond normally to stimuli and to associate in normal ways what is presented in consciousness with the memories of past experiences. What takes place in consciousness forms no normal relation with the consciousness of the self, and for the experiences of the disturbed period there remains an unclear recollection or a more or less complete amnesia. A clear comprehension of the situation or events, of which the individual is a part, is impossible. Ideas become confused in their arrangements and the thoughts that are expressed are more or less incoherent. Frequently hallucinations of sight and hearing are present and give to the disturbance the clinical picture of a delirium. The difficulties in understanding stimuli and in the elaboration of ideas usually make it impossible for the patients to gain correct ideas of their relation to location and to those about them, producing the symptoms of disorientation.

Disturbances of consciousness always produce some impairment of memory for experiences occurring during the period. The degree of this depends upon the depth, and varies between total amnesia and fragmentary and unclear recollections. The relation of memory disorders to disturbances of consciousness is of much forensic importance. It may be the only evidence that suggests a disorder of consciousness at the time of an alleged action. One must always consider the possibilities that the memory disorder may be simulated, and taken alone as evidence

it is often insufficient to judge as to the condition of consciousness at a particular time.

The loss of memory may only cover the period during which the action or events occurred or it may extend into time antedating this by hours or days, a condition designated "retrograde amnesia." This aspect of memory disturbances most frequently occurs in relation with disorders of consciousness resulting from traumatic injuries or the severe disturbances occurring in relation with epileptic states. They have been observed after strangulation and from carbon monoxid poisoning.

Disorders of consciousness as a rule produce changes in the normal appearance and behavior. These depend much upon the depth of the disturbance and the content of thought active in consciousness. Where the general reactions are those tending toward stuporous states, the activity may be decreased and the patient appears as if dazed or bewildered. The movements may be uncertain or aimless. When the content of consciousness is unpleasant or terrifying or of an ecstatic quality, and hallucinations are active, the actions may vary between restlessness and severe excitement in which the movements are senseless or are reactions to confused relations of thought and feelings.

In some dissociated states of hysteria and epilepsy the appearance may differ but little from the normal, and from observations of the action and behavior it would be difficult to form an opinion as to the condition of consciousness.

In complete unconsciousness the condition is one of coma. In this the individual appears as if in profound sleep. All reactions to stimuli are abolished and in the deepest grades even reflexes are lost.

This marked difference of appearance and behavior in disordered consciousness and the fact that in many instances clearness of purpose and plan are evident in the actions makes it necessary to be cautious in drawing too definite conclusions from the testimony of witnesses on matters bearing on the condition of consciousness of an individual at the time of an action.

Disorders of consciousness frequently occur from the pathologic influence of emotional or affective forces. The forensic relations of these is closely allied to that of problems involved in the neuroses and psychoneuroses in relation to personal responsibility. There can be no question as to the disabling effects of acute affective influences upon conscious activities. They may prevent normal understanding of a situation and may exclude from conscious associations those influences that are essential for controlling actions. They may even, when unusually intense or in those of psychopathic constitution, produce complete abolition of consciousness. Their influence in producing amnesia and upon the content of thought has already been considered.

Their more subtle effects upon the choice of ideas that enter into consciousness and their unconscious influence in determining character and will are matters of fundamental psychiatric importance. The recognition of this in the administration of the law as it bears upon questions

of personal responsibility in legal relations presents problems of much complexity.

A disorder of consciousness that theoretically and practically has possibilities for acts that are of much forensic significance is that known as sleep drunkenness. Normally as one awakens from sleep there is a brief period before consciousness is clear and the normal relation between self and environment is established. Pathologically this period may be lengthened, and instead of having a clear understanding of the situation the thought is confused by an intermingling of thoughts and feelings coming from dreams and those from their surroundings. Such a state is designated as sleep drunkenness. It is most commonly observed on sudden awakening from deep sleep, especially in the early hours. The more severe degrees of this are usually met with in those of psychopathic constitution or in epilepsy and hysteria. When the sleep has been disturbed by terrifying dreams the individual on awakening may be frightened, and in his lack of clear comprehension of his actual situation may commit assaults or acts of violence.

Unclearness of consciousness is a feature of the delirium occurring from exhaustion, from lack of nourishment, and in infectious disease. Usually the disorder is accompanied by hallucinations and more or less impairment of comprehension. Such conditions clearly interfere with the normal capacity of the individual to understand the nature of a situation or to judge his actions in normal ways. The diagnosis of these delirious states is more easily established when their association with a physical disease can be definitely shown or when caused by various toxic substances taken into the body. The most common of these is the acute alcoholic intoxication. In this normal mental function is impossible or impaired, and as far as the psychiatric aspects are concerned, such an intoxicated individual lacks full capacity for judging and determining his actions in a normal way.

There are occasionally noted in literature instances of unclear states of consciousness in relation with great physical pain. This has been noted in connection with the pains of confinement and with neuralgias.

Disorders of consciousness are frequent in epilepsy and are often in relation with actions and situations that are of forensic interest. These may occur in relation with convulsions or as brief episodes of unclearness or loss of consciousness in "petit mal" attacks or as independent states of longer duration.

A characteristic feature of the unclear states occurring in epilepsy is the presence of affects and ideas of an apprehensive or ecstatic quality. These not infrequently determine actions that may have harmful effects.

A special type of disordered consciousness occurs in epilepsy and hysteria that has been designated as a "dämmerzustand" or "twilight state" of consciousness. This usually begins as a sharp transition from the normal consciousness. The reactions of the individual seem to go on without a clear appreciation of the environment. The behavior is like that of one in a dream. This state may be brief, lasting only for a few minutes, or of longer duration, continuing for days or even months.



When the normal consciousness is regained there is amnesia for the experiences of the period.

While in a "twilight state" epileptics may perform complicated acts that seem to express definitely thought-out plans, but these are carried on in a mental state detached from clear contacts with the normal range of consciousness. They may make journeys by rail, buying tickets, and conducting themselves in an orderly way. When they regain their normal consciousness they have no memory for the experiences. More commonly the consciousness during these periods is intermixed with hallucinations and illusions, and ideas of an apprehensive and terrifying quality. These give to the behavior of the epileptic during these periods a frenzied and aggressive character that may result in acts of serious crime. Not infrequently these result in homicide or lead to sexual assaults or acts of incendiarism.

"Twilight states" of consciousness or states of mental dissociations are frequent episodes in hysteria. In many respects they resemble those occurring in epilepsy. In others the motives underlying the attack and the presence of definite hysteric stigmata may be differentiating features. The mental content during the dissociated period is largely determined by some dominating emotional interest or by phantasies in which are elaborated wishes or fears. The character of these thoughts and emotions is often acted out in their behavior. While the behavior usually shows the abnormality of the mental state, in many instances the individual, except upon careful study, may show little or no peculiarities in appearance or actions. Clinically these disorders occur as fugues, trances, or somnambulistic states. Many of the actions carried out in these may be quite complicated and the duration of the abnormal states may be from a few minutes to longer periods lasting days or even weeks. In these the individual may go on journeys from place to place, carry on occupations, and make business arrangements. As normal consciousness returns there exists an amnesia for the period of the disordered state.

Somnambulism or sleep walking is a disorder of consciousness that usually occurs in those of hysteric or psychopathic constitution, especially during the adolescent period. The actions in this state are usually rather simple, such as leaving the bed or wandering about the house or near vicinity. The dangers are more for the individual himself than for others. There is, of course, a possibility of serious consequences, but rarely have they had any forensic significance.

A special form of hysteric unclear states is represented in the reactions characterizing the "Ganser symptom complex." This is a mildly unclear state in which the reactions suggest a childish behavior. The responses of patients to questions show apparently a good comprehension of what was asked, but their replies are given indirectly and only approximate the correct answer.

Closely allied to the hysteric disorders of consciousness are the states of dissociated consciousness that occur in hypnosis and those that occur in the conditions described as double consciousness and multiple personalities.

By hypnosis is understood an artificial state of consciousness induced usually by the suggestion of a second party in which the perceptions, thoughts, and actions are controlled by the operator. The depth of the hypnotic state varies between mild drowsiness to the deepest grade, in which the one hypnotized acts only under suggestion.

While in hypnosis a wide variety of reactions may be carried on without being the spontaneous result of the will of the subject; sensations may be abolished and perceptions formed that have no basis in reality. Emotional tones may be suggested and movements and actions carried on at the will of the operator. It is even possible to produce striking modification of physiologic functions by suggestion. It has been observed that the time of occurrence of the menstrual flow may be fixed to a date suggested or the rate of heart action may be influenced. When normal consciousness returns there is more or less amnesia for the period depending on the depth of the hypnosis. In the milder degrees of hypnosis the subject may appear as if dazed or in sleep. In the deepest grade the eyes may be open and the appearance may show little to indicate the presence of the abnormal state of consciousness. Their actions are then entirely controlled by the one who has produced the hypnosis. Not only may suggested reactions be carried out during the period of the hypnosis, but suggestions given during this phase may be performed after the subject has regained his normal consciousness. These actions may be carried out days or weeks after the hypnosis and are designated as post hypnotic reactions.

Actions that are carried out by one under hypnotic influence either during hypnosis or as a post hypnotic effect cannot be regarded as voluntary acts of the subject. They are not the result of his normal conscious processes. The existence of amnesia for the period of hypnosis shows their lack of connection with the self-consciousness of the one hypnotized and that the state of consciousness during this period was different from the normal. As the thoughts that entered consciousness were restricted to those suggested by the hypnotist there was excluded from consciousness the psychic material that had been acquired through personal experience and which made possible maintaining standards of right and wrong, and the formation of normal judgments as to a situation. It would be impossible for one under hypnotic influence to exert normal inhibitions against a suggested act, and such an act committed in hypnosis would have the quality of an irresistible impulse.

The importance of hypnotic states in their relation to criminal actions and to those involving civil responsibilities is a matter of much theoretic interest, but one that is most difficult to examine in any practical way. Regarding the question as to whether a crime can be carried out from suggestion in hypnosis there are two different views. One is that any one who can be hypnotized is capable of committing a suggested crime, and the other is that no individual under hypnotic influence would commit a crime that is in opposition to his moral views and training. The majority of opinions expressed in the literature supports this latter view. Our knowledge regarding hypnotic states is almost entirely from

laboratory experiment and clinical studies in non-forensic relations. In such observations it is difficult to arrange an experiment that would correspond to the requirements of an actual act having serious criminal importance.

Whether one under hypnotic influence could be made to carry through an action such as forgery or perjury is a most difficult question to answer and has not as yet been definitely decided.

The problems presented in the conditions known as "double consciousness," dual or multiple personalities, are of much popular interest and theoretically must have importance in forensic matters. In these states an individual may pass more or less suddenly from a state of consciousness that is in relation with a normal self, to one in which the mental functions go on in systematic and co-ordinated ways, but in relation to a personality that usually contrasts strongly with the normal personality in qualities of temperament and conduct. The number of the personalities involved among the dissociations may be two or more. After varying periods this state may pass off and the individual becomes his usual self, but has no memory for what occurred in the dissociated or secondary state.

In respect to questions of capacity for legal responsibilities of dissociated personality states it is difficult to believe that an individual in a dissociated state should be judged by the standards applied to the normal individual. While his reactions and behavior clearly show that he has available much the same range of mental content as the normal personality, there is definitely lacking the relation with the consciousness of the normal self that has during its development built up standards of reasoning, moral discriminations and inhibitions, and by these his actions should be judged.

### DISORDERS OF MEMORY

The changes that take place in the brain in the act of perception and the process of thinking, and the feelings that accompany these leave more or less permanent residuals which form a latent material that is available for future use in mental functioning.

The capacity that the mind has for preserving these effects and of again recalling them into consciousness is the memory.

Each of these two aspects of memory, retention and recall, has its special relation to memory as a whole. Unless there is retention there can be no recall, and unless recall is possible latent memories are unavailable for mental use.

Memory is so interrelated with the processes of perception and the activity of consciousness, and the subjective feeling relations of the individual, that abnormalities or disorders of any of these must have a disturbing effect upon the quantity and quality of retention and on a later ability to recall events and experiences. If perceptions are impaired or impossible, retention will be disordered. These may be disordered by defects of the sense organs, such as impaired vision, color



blindness, or defective hearing. There are certain physical and psychologic conditions that must be present to make possible normal and accurate memories. It is necessary that the intensity of light should be sufficient, that the distance of the stimulus was such as to have allowed recognition in its correct qualities, and that the experience should have lasted long enough to have registered as an impression. If the stimulus is too weak to imprint itself on the receiving elements of the brain or if it does not command the attention, then retention will be faulty. Disorder of the attention is a common cause of impairment of retentive memory. This may be due to a generally diminished capacity for attention such as occurs in exhaustion or from the effects of alcohol or toxic substances. It may result from the lack of emotional interest that is present in feeble-mindedness or from the effects of a deteriorating psychosis. If at the time of the experience the mind is disturbed by strong emotional influences or if the attention is distracted by hallucinations, then much may escape observation or be so feebly imprinted that retention is brief and likely to be erroneous in quality.

Retentive capacity may be impaired by more or less normal conditions of consciousness. Experiences that occur in the unclear states of consciousness that are present during passing into sleep or awakening are feebly imprinted and are later difficult to recall with complete accuracy.

When disorders of memory occur following hysteric episodes it can usually be found that at the time for which impairment or loss of memory occurred there was a transitory disturbance of consciousness. The loss of memory for periods of hypnosis is a result of an abnormal state of consciousness that prevented fixation or that dissociated them from normal relations with consciousness.

Retentive memory may be disturbed in organic disorders of the brain without any disorder of consciousness being apparent. In such instances this is probably due to direct structural involvement of the receiving elements of the brain or their associative connections with other regions. Such conditions are frequent in general paresis, in senile dementia, and in arteriosclerotic disorders of the brain. They are especially marked in the mental disorder accompanying alcoholic polyneuritis (Korsakow's psychosis) and give to this disease its most characteristic feature. In these organic disorders of retentive memory the loss is chiefly for those of most recent experiences. The degree of this may be such that the individual is unable to give correct dates or the season of the year or tell accurately about recent experiences. Memories of earlier experiences can usually be reproduced with good accuracy.

Even if memories have been preserved they remain latent and inert until recalled into consciousness. The readiness and ease with which memories are reawakened in consciousness varies much within limits that must be regarded as normal. Common observation shows the marked differences that exist among normal individuals in this respect. From what is commonly designated as forgetfulness to definitely pathologic degrees of impairment there are transitions without sharp demarcations. The ability to recall memories is much influenced by the degree

and quality of the emotional relations of the experience and the habits and mental constitution of the individual. Perceptions and ideas of experiences that have occurred in relation with periods of fright and confusion are less easily arranged among associations than others, and consequently are difficult to recall with accuracy.

It is a tendency of memories or experiences that are unpleasant to the personality to be withdrawn from conscious remembrance. Their recall may be difficult or impossible or they may be reproduced in distorted forms. Not only is this for the experience itself, but details of names, persons, and places in relation with this may be forgotten or inaccurately remembered. Such memories are not lost permanently. From outside the consciousness they may exert influences that produce various pathologic symptoms in the field of thinking and behavior. It is this mechanism that accounts largely for the forgetfulness and often extensive losses of memory in hysteria.

Disorders of recall are always present whenever the retentive capacity of memory has been impaired. Thus following states of disordered consciousness whether from functional or organic causes, later attempts to reproduce memories of experiences that have occurred at these times may be faulty or altogether impossible.

In most organic processes involving the structure of the brain there is not only a disorder of retentive memory, but recall is also impaired. This not only concerns memories for the period during which retention was disordered, but may also involve those of the remote past.

Disorders of memory may be general and involve all perceptions and ideas without selection or may be only for special sensory memories. When the loss of memories involves either some special group of memories or covers a sharply limited epoch of time the condition is designated as amnesia. Amnesia may be total or partial. The amnesia may be for special groups of memory, such as those used in language, producing the clinical disorder designated aphasia or agnosia when the loss is for those memories necessary for the identification of objects. Amnesia may be of organic or functional causation. Organic amnesia is usually the result of some traumatic injury of the brain or may occur from the destructive influences of a cerebral hemorrhage, softening, or from the effects of a cerebral tumor.

More commonly amnesia is general in its scope and covers what has transpired during a certain period of time in which consciousness was unclear or obliterated. The cause of this may be the disturbing influence of a trauma involving the brain or it may be from the effects of toxic influences incident to the delirious states from fever or the infectious diseases. It is a disturbance that occurs from the effects of intoxicants or the narcosis produced by some drugs. It is frequently present in epilepsy either in relation with a convulsion or in the free intervals between attacks. In chronic psychoses caused by pathologic processes involving brain structure, especially general paresis and cerebral arteriosclerosis, disordered consciousness with subsequent amnesia may occur as an episode either with or without relation to convulsions.

Functional amnesia occurs chiefly in hysteria, and the form that it takes shows much variety. It may be for memories of events in which the individual has participated or for what has been observed by him as an onlooker, or for names and places.

Amnesia may sometimes extend into periods antedating the injury or disturbance of consciousness, and is then designated as retrograde amnesia. Memories that are most recently imprinted are usually least firmly fixed, and consequently those that have been retained from experiences in close proximity to the injury or disorder are more readily lost than those found in periods more remote.

It is possible, in suggestible individuals, to suggest in hypnosis experiences that are later reproduced as their own. Normally these will be corrected after the hypnotic state passes away, but by frequent repetition of this experience these memories may become more or less permanent.

The possibility of producing memories that are suggested is a matter of much importance in estimating the correctness of the information obtained under duress and in the so-called "third-degree" methods. There is little doubt but that mental states may be produced by the painful and trying situations under which many so-called confessions are obtained that may compel the individual to accept as his own that which is put before him by forceful suggestion. The more suggestible the individual and the harder the experience he is forced to undergo, the more easily may he be led into making wrong statements. This is especially true of those having an hysterical temperament, or in the case of children and individuals of weak intelligence.

When there exists a disorder of the retentive memory there is frequently a tendency for the individual to reproduce either freely and spontaneously or from leading questions, experiences that have no basis in fact. In these productions they narrate of actions in which they took part, of journeys recently made, of business deals they have undertaken, or tell of being in places that to one knowing their situation would have been obviously impossible. Such a symptom is called confabulation or romancing and is especially characteristic of the mental disorder associated with polyneuritis and in the presbyophrenic type of senile insanity. It is not uncommon in general paresis and in certain paranoid mental states.

Not infrequently, in some of the psychoses, memories are falsified to harmonize with the delusions that are held. In psychoses with deep depression there may be delusions of self-accusation, in which the patient may accuse himself of having committed some crime or harmful act. He may utilize in these events and experiences that were facts in relation with crimes that have actually taken place, but with which he had not the slightest connection. Paranoid individuals sometimes recall experiences of others and make them their own.

There sometimes occurs in hysteria and in psychopathic types of personalities a disorder of the quality of memories that not infrequently becomes a matter of forensic relations. This symptom which has been



described by Delbrück as "*Pseudologia phantastica*" is characterized by an intermixture of apparently deliberate lying with imaginations that are actually believed. Individuals having this symptom often come in conflict with the law as swindlers, or are known in their communities as eccentric characters or liars. Their statements not infrequently involve charges of sexual assaults or misdeeds of various sorts against innocent persons, and their pathologic type of mind makes them most unreliable as witnesses or complainants.

Disorders of memory come into relation with forensic problems usually in the following situations:

1. The question may be presented as to whether or not an individual has an amnesia or forgetfulness for an act of which he is accused. If so, what bearing does this have upon his capacity at the time of an alleged act, to have been able to understand the differences between right and wrong and the consequences of this act? If there exists a true amnesia it must be an evidence that at the time of the act there was such a disorder of consciousness as to have prevented the individual from distinguishing between right and wrong. The determination of whether the amnesia is real or feigned may be a matter of much difficulty. Its pathologic character becomes probable if there are evidences, apart from the lack of memory, of the presence of a disorder of mind, before or directly following the time in question, in which disturbances of consciousness are usually present.

2. The question of amnesia may concern a loss of memory for a confession or accusation that has been made subsequent to an act. Here again it must be determined whether or not the amnesia is pathologic or assumed. In judging in respect to its genuine quality one must take into account the general mental condition of the individual; the presence or absence of some well-defined mental disorder; and whether or not there exist memories of events and details not related to the confession or act in question that have occurred during the period of the amnesia.

3. The forensic problem may concern the question of the accuracy of the memories of the individual whether they are falsifications or distortions of actual memories or are entirely imaginations. In determining this one must be influenced by whether or not there is disorder of memory apart from that relating to the situation in question, or whether there exists a disorder of mind in which retentive memory disturbances or delusions are a common symptom.

4. Capacity of memory becomes a question in matters relating to the validity of civil acts much as making contracts or executing a will.

When there exists a disorder of memory either in the field of retention or recall such a state may result in the individual's forgetting matters relating to his possessions or his responsibilities to others.

5. Disorders of memory may affect the reliability of an individual as witness or complainant.

In judging as to the value of testimony in respect to accuracy of memory one must take into account the psychologic possibilities of the

perceptions on which the memories are based and whether or not there was anything in the condition of the situation or the constitution of the individual that would have made impossible such observation as he relates. The reliability of the testimony of a witness may be open to question if there existed at the time of the observation of an act in question anything that prevented normal perception. Defects of sense organs or the presence of some pathologic organic or functional disturbance of the mind at the time in question may have had an influence on the formation of normal memories or affected their permanency and ability to recall these subsequently. It is a well known fact that different individuals have differences in ability to describe events and experiences with the same degree of fulness and accuracy. This has been amply shown by experiment and common observation. It is a matter greatly influenced by the affective make-up of the individual, his suggestibility, and whether or not he is practised in matters of observation. Reliability of the memory of witnesses varies much in respect to age, and individual differences in degree of suggestibility and habits of criticism. There are those whose memory is easily influenced by illusions at the time of observation or by suggestions coming from a third party during later questioning. This is especially true of children, whose flighty attention, lively imagination, and easy suggestibility must always be considered in judging as to their statements.

The existence of a definite psychosis in an individual does not absolutely exclude his capacity for correctly recalling acts of experiences that may have been witnessed. Yet his general mental state is so pathologic that his capacity as a witness cannot be judged by the same standards as that of one who is normal. The testimony of an insane person must be considered as to whether it relates to statements that are made during the existence of a psychosis, regarding what has occurred before the onset of his disorder, or whether they are made after recovery concerning events that happened during his illness. In the former instance there is always the possibility that, having a pathologic state of mind, he may be more easily influenced by suggestion, or by ideas and feelings that are abnormal by reason of his mental disorder. In the latter case when the psychosis has passed away there must always be taken into account the influences that are active during the psychosis that may prevent normal interpretation of experiences, such as disorders of consciousness, delusions, memory falsifications, and affective disturbances.

#### DISORDERS OF THE EMOTIONS (THE FEELINGS, AFFECTIVE REACTIONS)

Under the term emotions are included those aspects of mental activity that are commonly designated as the feelings. In general usage the term feeling has a widely varying application depending upon the direction of viewpoint. It is used in respect to sensations, such as pain and temperature, to distinguish mental states such as feelings of contentment or dis-

satisfaction, of pleasure or displeasure, or in reference to personal interests, such as patriotic or religious feelings.

Feelings are subjective phenomena. They have their source either in instinctive reactions that are an inherent part of the nervous constitution of an individual or they are the results of personal experiences. In this latter respect they represent the personal responsiveness of the individual to situations, or ideas, or to changes in the physical relations of the body.

To distinguish more precisely the aspect that feelings have in psychologic processes the term *affect* has come into general use to designate the brief subjective changes of sensation of which the individual is conscious as mental processes are active. In contradistinction to those functions that are classed as intellectual those that primarily concern the feelings are designated as the "affectivity."

Affects give energy to mental experiences and their influence extends through all psychologic functioning. In general, affective reactions are experienced by the personality as either pleasant or unpleasant qualities. In their effects feelings have an influence upon both physical and psychic processes. In the physical field they determine the attitudes and expressions of the body and are the energizing force controlling behavior. They influence the course of many physical functions. Their effects are observable in changes of the rate and rhythm of the heart beat, the rate and depth of respiration, in changes in the distribution of blood-supply as seen in the blanching or flushing of the face in fear or embarrassment. They intimately influence gastro-intestinal functions and the secretions and excretions of glandular structures. On the other hand, they themselves are influenced by physical conditions within the body. Thus affective states of unpleasant quality are usual accompaniments of physical disease and pleasureable feelings may be induced by alcohol or drugs.

In their influence upon psychic activity affects of unusual intensity for the personality may disturb the normal clearness even to complete abolition of consciousness. Memory for periods during which affects of strong intensity were active may be impaired or abolished. Affects of unpleasant quality slow the speed of thought or may entirely block its further progress, while those of pleasant quality may accelerate the flow of ideas.

The influence that emotional states have upon the speed of thought reactions has found a practical application in experimental methods for the detection of guilt or personal familiarity with experiences that may have forensic importance. Jung has demonstrated that when stimuli such as suggested words or objects produce a delayed response, laboratory experiments indicate that such words or objects may awaken ideas or memories that are personally embarrassing to the individual and that the affects associated with these tend to slow the speed of association. The value of this in the detection of crime may have some significance, but the interpretation of its results are seriously open to error and would be far from sufficient to establish personal guilt or familiarity with an act in question.



Affective influences very largely determine the choice of ideas that enter into consciousness, ideas come and go in relation with changes in the affective setting. Affects have the quality of spreading out from a primary source on to other events or details that were associated with this, and thus give to the entire experience a common feeling quality. This is designated irradiation or transference of feeling. It is by this quality of irradiation of feeling tone from one idea to another that affects have a determining influence upon the choice of ideas that arise in consciousness. Those ideas that have been in associative relationship through common qualities of feeling tend to project themselves in consciousness whenever their specific feeling qualities are active. A group of ideas that is held together by a common feeling quality is designated as a complex. In its usual psychiatric application a complex is composed of ideas that have a strong emotional appeal to the personality, and by reason of this exert a more or less continuing influence upon mental activity.

Not only do affects of qualities pleasing to the personality favor the arising into consciousness of ideas that harmonize with these feelings, but ideas of strongly displeasing qualities may be repressed and excluded from ready association in consciousness. The affects of the repressed ideas may still retain their energy and may determine a variety of pathologic manifestations. The mechanisms of repression are of much importance in the productions of the mental abnormalities that occur in the psychoneuroses.

Affects are of relatively brief duration, coming and going as ideas change in consciousness. When feelings of the same quality persist for longer periods they are called moods. One distinguishes moods that are sad or depressed, pleasant or euphoric, and those that are angry.

In their influence upon actions in respect to their choice and direction and the energy that characterizes them affective forces are of fundamental importance in many forensic problems.

Actions are easiest determined along those lines that harmonize with personal feelings, and those actions that are determined by ideas having affect qualities strongly appealing to the personality are more difficult to inhibit than others. One is attracted toward that which is wished for and avoids what is disliked and feared. One attacks that which cannot be avoided or which one wishes to remove as harmful to personal interests. One can measure the intensity of an affect in relation with an action by the energy used in carrying it out. All action may be inhibited under unusually strong affective stimulation, as when one stands rigid or relaxed from fright.

Affects have a tendency to find outlets in action. But the quality of some affects may be such as to make this impossible. They must be held back or repressed. The effect of this is to produce tensions that are unpleasant for the personality. When no longer bearable they may find release in explosive outbursts that may produce behavior of definitely pathologic quality.

Pathologic disorders of the affectivity occur either quantitatively as

abnormalities in the intensity of emotional responsiveness or qualitatively when they differ in their form from those of the normal individual.

In congenital states of mental deficiency such as idiocy and feeble-mindedness there are varying degrees of diminished emotional responsiveness. This shows most prominently in a lack of concern for their relations to others. Even where there is no intellectual deficiency affective dulness may be a characteristic of abnormal types of individuals who show qualities of personality that has led to their being classed as "degenerate." Lack of emotional responsiveness is a characteristic of that variety of mental abnormality that has sometimes been designated as "moral insanity." It occurs as an accompaniment of the deterioration resulting from organic disorders of the structure of the brain in general paresis, the senile psychoses, cerebral arteriosclerosis, epilepsy, and some forms of alcoholic mental disorders. It is a characteristic occurrence during the progress of the deterioration of dementia præcox. In neurasthenia it may show as a more or less indifference or concern for personal responsibilities. Transitory lessening of affective responsiveness is not infrequent in some of the reactions of hysteria.

An increase in the normal feeling reactions is a characteristic of some types of psychopathic personalities and hysteric temperaments. In epilepsy there may be an irritability that shows itself in strong outbursts of feeling or anger. This may so overwhelm the consciousness that normal capacity for deliberation is excluded and actions are carried out without control by normal inhibitions. Such conditions from their suddenness of occurrence and the disordered state of consciousness with which they are associated are sometimes designated as "affect epilepsy."

The two most common forms in which pathologic disorders of the feelings occur are emotional depression and euphoria. Emotional depression is a usual accompaniment of all painful experiences. Normally this is but transitory and the average mood of the individual is soon re-established. Pathologically it is a reaction commonly met with in the early phases of a variety of psychotic disorders. It occurs as a more or less transient state in general paresis, arteriosclerotic mental disease, and dementia præcox. It is the outstanding symptom in the depressed phase of manic-depressive insanity, and in some types of psychoses occurring in the later period of life, commonly classed as melancholia. In these relationships it may be the underlying influence determining acts of violence against self or others.

One of the most frequent and well characterized forms of abnormal feeling reactions is what is designated as anxiety. This occurs as a feeling of apprehensiveness associated with sensations usually of tension in the precordial region. It may be an incidental feature in psychoses, such as states of mental depression or epilepsy. It may occur as attacks in cases of severe organic disorder of the heart. It is especially met with in the psychoneuroses, where its origin seems to be in relation with the pathologic influence of affects coming from ideas that have been repressed from consciousness. Anxiety is considered by Freud to have intimate relationship with the emotional aspects of the sexual life. If

there is no adequate outlet for the sexual tensions the affects concerned may be transformed into feelings of anxiety.

The anxiety attacks sometimes are manifested in localized symptoms referable to various bodily organs and functions such as respiratory difficulties, asthmatic attacks, functional disturbances of the heart, or disturbances of the normal secretions and excretions. By transference the anxiety may associate itself with ideas of special situations or actions, and in this way may appear as phobias or fears, such as fears of crowds, closed places, or particular situations. The determination of the existence of an anxiety state in relation with an action of forensic significance may present difficulties. The anxiety may be of a degree that impairs the capacity of an individual to understand a situation in a normal way and may be so overpowering as to abolish normal inhibitions to an impulsive action. If the attack has disturbed the clearness of consciousness there remains afterward a more or less impaired memory for the experience. The possibilities of its pathologic quality become more certain when it occurs as an incident in the course of a well-defined psychosis, such as epilepsy, alcoholic mental disorders, or in the psychoneuroses.

Euphoria or a state of emotional exhilaration is a characteristic feature of the manic phase of manic-depressive insanity and of some types of general paresis. It occurs in the early stages of alcoholic insanity and from the effects of some drugs such as morphin and cocain. It is of importance in forensic relations as an evidence of the existence of a psychotic disorder that might exclude capacity for normal responsibility. With a euphoric mood, especially in manic excitement, normal inhibitions are usually pathologically decreased and actions occur without normal control. A dominant euphoric mood may interfere with a normally balanced consideration of an act in question. What is not in harmony with the mood may be excluded from normal association and judgments formed regarding a situation might be incorrect. In respect to civil responsibilities the euphoric mood, especially in general paresis where it is combined with impairment of judgment, may lead to wasting of property and resources and injury to the rights of others.

In respect to the forensic relations of affective disorders it must be appreciated that these are very largely the determining influence in the formation of character. The wide differences that exist in the quantitative and qualitative character of affective reactions in individuals must be clearly understood in judging their thought and actions.

The importance of pathologic affective influences in relation with criminal actions is seen in their production of abnormal types of character that cannot be judged by the standards applied to the normal man and by the acute effects of these in disturbing consciousness and impairing normal inhibitions. In respect to capacity for civil responsibilities pathologic disorders of the feelings may prevent normal understanding and judgment as to financial and property matters and a regard for the rights of others. In judging the thought and actions of



children it must be appreciated that their affective reactions, even within normal limits, are different in intensity and quality from those of adults.

Whenever there are abnormal reactions and qualities of feelings, careful examinations should be made to determine the presence of some psychotic disorder that in itself would exclude capacity for legal responsibility.

### DELUSIONS

The final result of the process of association or thinking is the formation of conclusions or judgments. Into these enter the material that has been collected by the process of perception and held as memories. If either perceptions or memories are disordered, the effects of this must pathologically influence the formation of judgments, and the conclusions formed will not be in agreement with realities.

Conclusions are continuously being formed during waking periods, as thoughts arise in consciousness and recede to give place to other arrangements. To a considerable extent these arrangements with their resulting conclusions go on at times when consciousness is not clear, as in the borderline states of normal sleep and in the occurrence of dreams. The material from these periods is not uncommonly used later in conscious thinking, either with normal recognition of its unreal quality or pathologically mingled among other ideas without discrimination.

Conclusions are either the product of the imagination or are the results of one's own experiences or those of others that are accepted as truthful. Normally a clear distinction is maintained by the individual between what is imagination and what is knowledge controlled by experience. The clearness with which this distinction is made varies much among individuals and is normally influenced by maturity of mind and cultural relations.

Among children imaginative thought is long a normal phenomenon, the distinctions between what is real and what is imagined being acquired gradually during the progress of experience and education. The degree with which the imagination persists in children varies much and has a direct influence in the shaping of character and mental health. In normal directions this may be the source of the creative energy that determines the mental and physical activities toward useful lines of occupation in fields in which the imagination has an important part. In pathologic directions the imaginative interests may become too great an attraction and its pleasing quality to the personality leads to a withdrawal from realities and experiences that are difficult or displeasing.

The prominence of the imagination in the mental life of children has a forensic importance in respect to their reliability as witnesses or complainants. Often their accounts of experiences are distorted or embellished by what is purely imaginative and created out of their phantasies.

Among primitive people and those whose lives have been lived far

from social contacts and advantages of training, much that is imaginative is accepted as real or there is lacking the normal feeling of need of proof. The content of their myths and religious beliefs are held by them as realities, but if expressed by one of a more cultured group would definitely be classed as pathologic.

That which is imagined corresponds to what is usually designated as belief in contradistinction to that which is knowledge derived from experience. It represents ideas that are accepted without being subjected to proof. Their emotional quality has a strong appealing force for the personality that leads to their acceptance as something satisfying, and for this reason efforts at disproof or dissuasion are firmly resisted, and they maintain a tenacious hold upon the interests of the personality, often in spite of obvious falsity. The distinction between what is a belief that is wilfully held by the patient against disproof and what is a delusion is often vague and a differentiation cannot always be made with certainty. In general, the beliefs that are most strongly held concern ethical relations. They relate to matters of personal honor, to religious or political interests, and lie largely within the limits of what are regarded as matters of personal opinion.

If a conclusion is contrary to fact and its correction is accepted by the individual it is regarded as an error or mistake. If its correction will not be accepted it constitutes a delusion.

A delusion is a belief that is contrary to fact; is not in harmony with the individual's environment or training, and cannot be corrected by reason or experience. Delusions have their origin not in what has been experienced, but in the belief of the individual. Like beliefs in general, they are the product of the effort of the individual to satisfy some affective need. Their source is in the feelings and not in logical reasoning. Beneath the formation of the delusion there lie pathologic affective forces that turn the thought from its normal course to interest in ideas that are satisfying and appeal to the personality in spite of their distorted representation of realities. It is this pathologic quality of the feelings or affectivity of the individual that marks the deluded person as one who is disordered mentally in functions and extent far beyond the mere holding of delusions.

A delusion has certain qualities that give to it distinctive characteristics. The first of these is that it is contrary to fact and highly improbable. Not infrequently the nature of the content of a delusion makes it difficult to decide as to its lack of agreement with fact. It might very well be possible and the proof of its correctness could only be obtained by a careful investigation of the facts involved or their obvious improbability. It must be judged in relation to the qualities of thinking and judgment that characterized the mental habits previous to the development of the belief in question.

This difficulty is commonly encountered in estimating the truth or falsity in supposed delusions of jealousy or infidelity and of beliefs in the perpetration of fraud or deprivation of just rights. Not even if the mind of the individual gives evidence of definite disorder in fields or

reactions not involved in the delusion can there be certainty of falsity of the belief. There may often be elements of fact in the content of the delusion; as when one who has suffered a loss of property has the conviction when in a depressed mood that he has been totally ruined, or when, after some moral delinquency, the individual believes he will be eternally lost or has committed the unpardonable sin.

It is the general reaction of the individual to the facts involved, the way he deals with them in his thoughts, his firmness of belief in their correctness and its contrast with his former thoughts and feelings that aids in determining the probability of the truth regarding the facts and their delusional quality.

A second characteristic quality that marks a delusion is its lack of harmony with the individual's experience and training.

In itself the content of a supposed delusion is no conclusive evidence as to its insane quality. In evaluating this one must take into account its harmony or disagreement with beliefs held by others of like age, sex, and environment. Many beliefs expressed by primitive people, or those who have lived in isolated surroundings or have grown up in environments in which primitive lines of thought are matters common to others of their group, would if expressed by others of more cultured training be regarded as delusions.

Beliefs concerning abstract matters or religion are by their nature not generally susceptible to proof or disproof. One not infrequently knows of peculiar beliefs on religious subjects or on matters of health and disease that are held by cultured individuals who are not regarded as mentally disordered. These in their mystical and phantastic qualities and their opposition to accepted facts or common beliefs often do not differ in any important respects from what is expressed in the thoughts of many who are definitely insane, and in consequence are regarded as delusions.

The third criterion that distinguishes the delusion is the impossibility of convincing the possessor of its falsity. The emotional interest that the individual has in his belief causes it to be held against all appeals to reason or normal experiences. In this respect it differs fundamentally from what is classed as an error or mistake.

There is some difference in the degree of tenacity with which a particular delusional idea may be held. It may be held unchanged in its main content for many years, as occurs in paranoia and paranoid forms of mental disorders. Such beliefs are classed as fixed delusions. Other delusions are changeable. Their content varies with differences of clearness of consciousness or changes with different affective needs. The original delusion if it has not the needed satisfying qualities leads to the development of others that are suggested by new experiences or environment. Delusions may exist in more or less isolated relations, their content and structure having little reference to other delusions that the individual may hold. Such delusions are designated unsystematized delusions. In other instances the various delusional ideas may be developed from other delusions and one delusion interwoven among



others into a connected and related whole. New material and memories of former experiences are reworked in relation with the delusion. Such delusions are classed as systematized delusions. The more systematization exists, the more is it an evidence of the extent that normal mental processes are changed and influenced by the pathologic.

Delusions may have their sources in quite different mental processes. They may arise from disordered perceptions; from unclear states of consciousness; from disorders of the feelings or emotions, or they may be logically developed from existing delusions.

When the perceptions are disordered, as in hallucinatory mental states, delusions of an explanatory type not infrequently develop from the disordered sensations. The chronic alcoholic who imagines he hears voices, develops delusions of reference and persecution. The patient with visual hallucinations in delirium tremens readily develops false ideas regarding his environment. They may originate in transient or more chronic states of unclear consciousness in which any clear understanding of realities is prevented by the incapacity correctly to arrange perceptions in their proper relations with memories of previous experiences and false conclusions are easily elaborated into delusions. While commonly the delusions formed under such conditions are corrected as lucid consciousness is re-established, in occasional instances they persist long after the conditions causing them have disappeared. The delusions elaborated from dreams are examples of this type of origin. The material from these is carried over into the waking state and accepted as realities.

By far the greater number of delusions have their source in the affective settings or in the feelings of the personality. Wishes and fears may determine the content of the delusion. These grow out of some group or complex of ideas that have had a strong affective appeal for the personality, and have been determined very largely by conflicts and situations that have become unbearable. That which cannot be obtained or achieved in reality may be realized in a delusion, or that which is feared may be distorted into harmless and bearable ideas.

Many delusions are logical developments from existing delusions. A patient has the delusion that he is persecuted or regarded with suspicion; therefore, he must be a person of some unusual importance. A young woman held the delusion that she was to give birth to a child. As she had had no sexual experience she expressed the belief that she was the Virgin Mary and that this would be the immaculate conception. The fact that delusions so largely have their source in the emotional tone dominating the interests of the personality leads to the development of further delusions and choice of material that is in harmony with these moods and feelings, and to the resistance of lines of thought that are in opposition to this. Thus, in the presence of the euphoric mood, the delusions are of an expansive type, and when the emotional tone is one of sadness, the content of the delusions is depressive.

A fundamental factor underlying the formation of certain delusions is the inherent tendency of some types of personality to keep them-

selves free from personal blame and to shift from themselves responsibilities for real or imagined failures. This element is probably of importance in the determination of delusions of the so-called explanatory type. The material utilized in these is largely derived from their experiences and environment. If an individual is deprived of a position to which he believes he was rightly entitled he may in his delusion lay the blame for this to hostile influences. Difficulties in the domestic life are not results of his own faults, but are explained in delusional ways as due to the misconduct of the mate or the influence of enemies. An actual feeling of pain or physical discomfort is laid to some imagined disease or to the effects of poisons that have been given to him in his food or medicine.

In most discussions of the subject of delusions some attention is given to their classification and various designations have been given to the types and forms in which the delusions occur; these from time to time have changed with the progress of psychiatry or are presented according to the individual viewpoint of the writer. These classifications have been made according to the character of the content of the delusions, their permanency, and their relation to other existing delusions.

In a general way the content of a delusion is either expansive or depressive in its emotional quality.

The underlying factor determining the choice of content of the expansive delusion is the euphoric mood, the feeling of personal well being that dominates the emotional state of the personality. The delusional ideas appear as delusions of wealth, of great physical power, of being some person of great renown, etc. They are most commonly observed in the clinical disorders of general paresis, in manic excitement, and in the paranoid mental states that occur in dementia præcox, in paraphrenia, and in terminal dementia.

On the basis of a sad or depressed emotional state there may develop delusions of a depressive content. In a general way it will be found, in efforts at classification, that the content of depressive delusions relates either to matters for which the individual holds himself responsible, the causes for which lie within himself, and those in which the difficulties come from the environment. In reality, it is difficult to make any absolute and sharp distinction between these two aspects of direction taken by the pathologic ideas, as it is impossible to consider personality and its problems entirely separate from those of environment. The source of the affective energy that determines any delusional formation must lie largely in conflicts in efforts at adjustment between these two directions. Illustrations of the class of delusions that concern the personal responsibilities of the individual are those relating to moral conduct. These commonly take the form of belief of having committed some wrong action or offended against some moral law. For this the individual blames himself in ideas of self-accusation. In another form the depressive content is centered on problems of physical or mental health. The individual has a pathologic degree of solicitude or worry over some imaginary or exaggerated disease or abnormality of the

body organs. This may to some extent be more or less reasonable in its possibilities or may be entirely absurd and phantastic. A determining influence in these hypochondriac delusions may be the presence of illusions or hallucinations of the tactile perceptions, in which either the disturbed sensation gives origin to the pathologic thoughts or the thoughts are supported by the harmonizing hallucinations. When the delusions concern pathologic worries over financial affairs and appear as ideas of coming to want or ruin, they are classed as delusions of poverty.

The foregoing types of delusions are characteristically observed in the depressed phase of manic-depressive insanity. They are usually a feature of the depressed mental states with anxiety occurring in the late adult or early senile years and are frequently observed in the depressed phase of general paresis.

The other general class of depressive delusions largely concern the relation of the individual to his environment. They chiefly occur as delusions of reference or suspicion and of persecution. In delusions of reference, in their simpler form, the individual believes that the conversation and attitudes of others or that comments in the papers have reference to himself. This may vary from vague feelings of suspicions to firm convictions that he is the object of the hostility of others. From delusions of reference to those of persecution is but a gradual transition. The form that the delusion takes depends much on the interests and intelligence of the individual. Usually it is some particular person or organization that is responsible for the persecution. They interfere with his home and business life, some one follows him as he goes about, various difficulties are put in his way. He is deprived of his position through no fault of his own. Wherever he goes or in whatever he does he finds hostile influences. With delusions of persecution there frequently are present hallucinations, chiefly of hearing. Voices and delusional thoughts harmonize and are mutually supporting.

A frequent form of delusion developing out of conflicts of personal interests with environmental situations is designated as delusion of jealousy. In its simplest form it may be but feelings of neglect or suspicion of the unfaithfulness of the mate or one on whom the interests are fixed. In this degree it does not differ essentially from mental attitudes not infrequently observed under comparatively normal relations. In its fully developed form it is a strong conviction. The quality of the emotions involved in ideas of jealousy gives them an unusually strong compelling hold upon the attention and resists all efforts at disproof and strongly influences attitude and conduct.

This type of delusion is met with among both sexes and appears in its most characteristic form in some of the mental disorders from chronic alcoholism. It may here have its origin in the domestic difficulties incident to alcoholic habits and the sexual difficulties that complicate these. The delusions often contain improbable accusations against the mate and so hold the interests of the subject that he is most active in looking for proof of his accusations. Not infrequently they involve slander and



baseless charges against innocent parties. A patient suffering from a chronic alcoholic psychosis ascribed the parentage of each of his 8 children to as many different men and openly made accusations against these.

Delusions may center about the complex that the individual is being deprived of his just and legal rights. This may relate to property to which he believes he is entitled or that he is the beneficiary in some testamentary act and is being deprived by fraud of what should be given him. This is the characteristic delusion of the querulent and litigious types of insanity. Influenced by such delusions the individual undertakes persistent efforts at legal redress and may write slanderous letters or make groundless charges against those he imagines are responsible for the injustice he has received. The nature of the allegations in these delusions often makes it difficult to form a correct judgment of the truth of the facts involved. They are often based on certain elements of truth and their plausibility and the general intelligence of the subject not infrequently gains support for the efforts of the deluded individual toward securing legal attention and justice. Generally these ideas are developed to such an exaggerated extent and their hold upon the interests of the individual is so pathologic that their delusional quality becomes apparent. This is further emphasized when these thoughts stand out in marked contrast to what the individual expressed in periods when there was no question of mental abnormality or when they are associated with definite evidences of disorder in other mental fields. In states of extreme depression, especially in the melancholia of presenile years, there sometimes occurs a delusion of a nihilistic type. In this the content concerns the non-existence of matter or person. The patient expresses the idea that "there is no world." "He cannot die; everything has been destroyed," "his own body or self does not exist." The phantastic and absurd character of these delusions is an evidence of a progressing mental deterioration in addition to the emotional depression.

The forensic importance of delusions lies largely in two directions. One of these is their effect upon the understanding of the individual regarding realities either in respect to himself or his environment. The other is that their inherent marked emotional emphasis gives them a strong determining influence upon conduct and actions.

Their influence upon reasoning and action depends much upon the acuteness of the disorder of which they are a part and upon their content. In the early phases of their elaboration their affective hold upon the interests of the subject is usually strong and may directly lead to acts of violence against self or those they believe are responsible for their difficulties. In the course of time and when there is progressing an emotional deterioration this influence is less, but still must always be regarded as a potential factor upon thought and action. In respect to the influence of content upon the forensic relations of delusions, the closer this content concerns the immediate personal interests, the more important do they become for determining the mental attitude and conduct. Thus delusions of jealousy and unfaithfulness, of personal

wrong doing, of persecution and injustice, and of affliction with disease, have a particularly strong hold upon the personality and commonly lead to criminal conduct. Expansive delusions are in general of far less forensic importance than those that have developed on the basis of a depressed or suspicious mood. Their relation to acts of violence is far less frequent than is their connection with problems of incapacity for civil responsibilities in business and social matters. Their association with an exhilarated mood and impairment of judgment leads to a waste of personal resources and financial involvement of others. Their exaggerated ideas respecting their own possessions and prominence overbalances their appreciation of the rights of others and must make them psychiatrically incapable of making contracts or purchases, or accepting responsibilities and obligations.

Delusions that have developed in association with a depressed or suspicious emotional background very commonly come into relation with medicolegal problems.

Every individual with delusions of a depressive type, especially when these concern his own personal situation, must be potentially considered as liable to commit suicide. The danger is somewhat less during phases in which there is present any marked degree of psychomotor retardation, such as is usual in the depressed phase of manic-depressive insanity. The danger is greatest during convalescence when the inhibitions are lessening, but the delusions persist. Not uncommonly efforts at self-destruction involve others than the subject of the delusions. A parent who has the delusion that the family is coming to want and ruination may in efforts at self-destruction destroy the children or other members of the family. Suicide by burning may result in destruction of life and property and financial loss to others. Attempts at rescuing persons committing suicide by drowning have resulted in loss of life of the rescuer. Larceny has been known to occur as a result of a delusion of being in want, and, as a result, stealing to supply imagined needs.

It sometimes occurs that subjects of delusions of self-accusation make false statements regarding criminal situations or confessions of acts of crime of which they are in no way to blame.

Hypochondriac delusions may lead to refusal to take nourishment that results in death or the patient may adopt peculiar habits of diet that may have serious consequences for his life. He is not infrequently driven to suicide from fear of the consequences of some imagined disease or to acts of self-mutilation, particularly of the sexual organs when these form the center of his delusions. These delusions may lead the individuals to make charges of malpractice or even serious assaults upon physicians who they feel are to blame for their situation. Delusions of reference and persecution, perhaps more than any other type of delusion, are the motives for many serious criminal acts against those who in the disordered mind of the subject are regarded as responsible for his difficulties.

Delusions of jealousy and infidelity may lead to criminal assaults or murder. They not uncommonly form the motives that lead to slander

or writing anonymous letters the contents of which are sometimes indecent and violate the postal regulations. They frequently determine hostile acts against the business or professional interests of those involved in the delusions.

In respect to the influence of the existence of delusions upon responsibility for civil acts or capacity to make a will it is abundantly shown in psychiatric experience that no act of an individual with delusions can be regarded as completely free from pathologic influences that are directly or indirectly in relation with the delusion. The fact that an act in question is not the direct outcome of the delusion does not imply that the one who holds a delusion is mentally capable of being regarded as responsible for the specific act. Because one who has delusions may be able to reason logically on many matters and arrive at correct conclusions does not prove that the mind of such an individual is able to make a decision that must be judged as normal in other matters not related to the delusion.

There is no criterion that can be used to determine accurately the subjective influence of delusions upon mental processes. The factors and elements involved in the formation and existence of delusions ramify widely among mental processes, the normal intermingling in its effects with the abnormal, the real with the unreal, and out of this intermixture must be drawn the material that is to be utilized in deliberation and choice. It is perhaps less the content of delusions that is disturbing in normal mental functioning than the affective energy, the background of feeling qualities that has forced the formation of delusions and made possible their continuance. The influence of this cannot be disregarded in its possibilities of interfering with normal choice and action in any specific direction particularly when an act closely concerns the immediate interests of the personality.

While the existence of evidences of normal choice in many matters may be shown in one who holds delusions this does not imply that in other matters apart from those related to the delusion normal forces should be equal to the abnormal in determining a choice between right and wrong. In the pathologic state of mind in which delusions occur the abnormal has proved itself to have a stronger influence upon the personality than the normal. Only by this could the delusion have been formed. The dominance of abnormal over normal cannot be regarded as solely limited to the presentations of facts involved in the situation out of which the delusion developed, but must be considered as a possible influencing force in any choice or act.

In respect to the influence of delusions on the question of abolishing the resistances to an impulse to commit a harmful or criminal act, there would seem to be no denial of this when the act is the direct consequence of the delusion. When the direct relation does not seem apparent, the resistances that the subject is able to oppose must be far less than those of one who is normal. The continued presence of delusions, with their strong emotional emphasis for the personality, must in time tend to break down resistances, so that a point may be reached



when it is impossible longer to check an impulsive act even if its consequences are known to be wrong. This becomes more easily possible in those mental disorders when in addition to the delusion there is present a progressing mental deterioration or when there exists a congenital feeble-mindedness.

### DISORDERS OF THE IMPULSES

Feelings and affects have a tendency to express themselves in actions. This outlet brings relief to tensions which the individual experiences as unpleasant feelings, and by their release in actions he gains a feeling of pleasure and comfort. Feelings that have this urging or forcing quality are designated as impulses. Originally impulses are independent of ideas; they exist as feelings and only later during the development of ideas and intelligence do they become intimately associated. In childhood actions are largely controlled by impulses. The child acts in the way his feelings urge. As intelligence is acquired in the experiences of mental development the child learns to control impulses by his intelligence, and the more completely an individual acquires this capacity, the more successful is he in his adjustments to the requirements of life.

Those impulses that have their source in fundamental physical and mental needs of the individual stand apart from all others in the importance of their relation to problems of action and conduct in the environment in which he exists. These largely concern problems of self-preservation and are represented in the impulses serving purposes of nutrition and those related to the sexual life of the individual. When impulses are quantitatively and qualitatively different from those of the average individual they are classed as abnormal impulses. If abnormal impulses lead to conduct that disturbs the rights of others and is in opposition to the laws they become problems that have forensic relations. The abnormality of the impulse itself, if it does not find expression in actions, is not a matter that directly concerns the law except as it may be an evidence of an abnormal mental state that apart from the impulse itself may have relations with problems of conduct.

Impulsive actions differ from voluntary actions in that they are not matters of choice, but are determined by one impelling motive. They are different from automatic and reflex actions as there lies back of them a conscious purpose.

If consciousness is disordered or if there exists a derangement of mind, that impairs or abolishes the capacity to reason and form decisions, actions may take on an impulsive character. Such a condition has sometimes been described as "impulsive insanity."

The need of the individual to find for himself relief from tensions and discomforts, arising from affective abnormalities, commonly leads to the association of impulses with some agents or experience that will accomplish this. This association is frequently in relation with intoxicating liquors or drugs, and in this way there become established

habits in which the impulse finds expression. By reason of the interworking of the deteriorating and disturbing effects of these agents upon mental and physical functioning and the lessening of inhibitions, as impulses continually find release in action, the individual acquires a pathologic type of character. Impulses associated with alcoholism and drug addiction frequently come into relation with conduct disorders with which the law must deal. Of these, the abnormal impulses of alcoholism are the more important as far as their effects upon actions are concerned. Alcohol has the physiologic effect of producing in the early phases of intoxication a feeling of comfort and mild stimulation from its influence in lessening inhibitions. Once the impulses are given way to, future capacity for resistance is lessened. Control becomes further impaired through the chronic deteriorating influences of alcohol upon character and nervous functioning. The prominent features of this are a weakened capacity to resist impulses of all sorts and a gradual impairment of intelligence and of the finer and ethical feelings. The circumstances under which abnormal alcoholic impulses are started are various. Some of these impulses have their beginnings in occasional and social drinking, but more commonly they are the results of inherent weakness of character and psychopathic traits that when associated with the use of alcohol become difficult or impossible to resist. In the latter class is the periodic occurrence of alcoholic impulses of the type of dipsomania. In this disorder there periodically occur moods of ill humor with nervous tensions and anxiety symptoms. These, finding ease in alcoholic indulgence, become established as definitely abnormal impulses. The periodic recurrences of the ill humors has suggested the close relation of dipsomania to epileptic disorders.

If abnormal affect tensions find relief in the use of some drug such as opium and its derivatives or cocaine the satisfying character of the experience leads to the fixation of these as abnormal impulses or drug habits. Rarely abnormal impulses are associated with other drugs, such as ether or chloroform. In abnormal drug impulses, as in alcoholics, there is an interworking of affective forces and the acute and chronic deteriorating effects that the drug has upon psychic functioning and character. Alcohol and drug addictions as they are associated with abnormal impulses are frequently matters of forensic importance. Both of these usually acquire at some stage the quality of irresistible impulses. The difficulty is in establishing when they become irresistible. At one period there must have been a time when the impulses could have been resisted.

Both alcohol and drugs may produce psychic disorders that exclude the capacity to reason as to the nature and relations of an act or to control conduct. Their influence upon character is such as to lead easily to criminal acts. Sexual crimes are often committed under the influence of alcohol or because of its deteriorating effects, and aggressive acts in the form of assaults and homicide are not infrequent. Stealing and burglary are sometimes committed to secure alcohol or drugs to satisfy cravings. In social and civil relations a wide range of conduct disorders

are directly and indirectly caused by the effects of these abnormal impulses.

By far the larger number of forensic problems relating to pathologic impulses concern abnormalities of the sex life.<sup>1</sup> Sexual impulses are expressions of instincts that are of fundamental importance for the biologic problems of the individual. They are impulses that have been forced to undergo modifications and adjustments during the development of civilized society, and this has given to the individual problems that are difficult to adjust in their relation to physical and mental health. Even in normal relations they present serious difficulties. Between modifications and variations of more or less normal expressions of sexual impulses and definite abnormalities there are many close relations. Not only are problems of the sex impulses difficult to care for, as they are conscious interests, but through mechanisms of repression they exert a powerful influence from subconscious fields upon character and conduct. There is much to support the belief that they are of fundamental importance in the causation of the neuroses and psychoneuroses and their allied clinical manifestations.

Sexual impulses vary in importance among individuals in respect to sex and age. Man being the more energetic and active in his sex life has more possibilities for abnormalities than woman. Sexual impulses are of unusual strength in adolescence and early adult life and normally lose their force in the advanced years.

It must be accepted as a fundamental proposition that the adult who is mentally normal is able to control his actions resulting from sexual impulses. Any other assumption would create situations that would be disastrous to social order.

Sexual impulses become problems of forensic importance only as they are abnormal and result in actions that bring harm to others or tend to lower moral and ethical standards of social life. The difficulty is to determine what are abnormal sexual impulses and actions. Even among average normal individuals there are such variations in qualitative and quantitative relations of sex activities that what is normal and what is abnormal must be decided by more or less arbitrary standards.

A decrease or absence of normal sexual impulses is not uncommonly observed among the insane and from the effects of the chronic use of alcohol or morphin. A pathologic increase of sexual impulses is an accompaniment of some forms of insanity and in those who are of psychopathic constitution. The question may be presented as to whether the increased sexual impulses were the consequences of a pathologic accentuation or a loss of normal inhibitions by reason of mental disorder. If mental disorder be shown to exist then the pathologic character of the impulse may be assumed. They occur especially in those psychoses in which there is an elevated mood as in manic excitement and general paresis. These may lead to gross conduct disorders, such as contracting sudden marriages, associating with prostitutes, or exhibitionism. In the excited forms of general paresis, where in addition to the excitement

<sup>1</sup> See chapter on "Mental Perversions of the Sexual Instinct."



there is an impairment of judgment, sexual misconduct frequently becomes a serious matter. When deterioration occurs in senile years or when the consciousness is unclear, and at the same time there exists an increase of motor activity, sexual impulses assume a definite pathologic quality that often leads to offenses against the law. It is under conditions such as these that the exhibitionism and sexual assaults of seniles and epileptics usually occur.

The most frequent expression of abnormal sexual impulses is unquestionably the masturbation. In a large majority of all individuals who suffer from gross abnormalities of the sexual impulses, one finds that masturbation had some relation to these in the beginning. The seriousness of the act of masturbation lies not alone in its occurrence, but in the length of time it has been practised and the effect it has upon the individual. It is not uncommonly present during infancy and early childhood. Its occurrence at this age, while having little forensic interest, is possibly an important matter in the later development of the sexual life, particularly as an influence determining the occurrence of the psychoneuroses.

If sexual impulses find outlets in masturbation they tend to occur with a frequency that increases the difficulty of exercising a normal control over sexual interests. Too frequent indulgence in masturbation produces physical and nervous exhaustion and tends toward creating a continued occupation with erotic matters that keeps the sex life in too great prominence among the mental interests. It accentuates the tensions accompanying sexual interests and forces upon the individual the need of finding some relief in outlets. Serious effects commonly occur when the practice is suddenly given up and the outlets that have been developed are shut off. Affect tensions then being deprived of their usual opportunities for relief exert pathologic influences on the nervous functioning that clinically produces psychoneurotic disturbances of an anxiety type. If sex needs are overdeveloped, greater difficulties are forced upon the individual in maintaining a normal adjustment of his affective life to the requirements of his environment and commonly lay the framework for the development of a mental disorder.

Outlets for sex impulses tend to become fixed in directions in which they have first had expression. If this has been in acts of masturbation it later on becomes difficult for the individual to find satisfaction in normal heterosexual relations. In civil relations this may be a factor in leading to breaking marital relations. In criminal relations masturbation may become a matter of importance as it concerns acts of exhibitionism or forcing abnormal sexual practices upon others.

There are certain sex impulses that are so grossly abnormal in their quality that they are commonly classed as sex perversions and one who possesses these as a sexual pervert. While some of these have no close resemblances to impulses of normal individuals, others differ only quantitatively from tendencies that are not infrequent in the sex life of individuals who must be looked upon as being normal.

Perverted sexual acts are modes of expression that the individual

adopts either as the only way to satisfy his sex impulses or to increase the intensity of his pleasure.

It is only as sexual perversions lead to actions that they become of medicolegal interest. The forms that the perversion may take are relatively limited in variety. The more common of these are sexual intercourse with animals, or bestiality or sodomy; intercourse through the anal orifice or pederasty; cruelties and physical injury of the partner in the sexual act, or sadism; the infliction of pain and injury upon the self, or masochism; mutilations and sex relation with the dead body, etc.

Sex perversions are probably in most instances acquired. Nervous organizations may be inherited that make difficult the normal control and direction of the affective influences centering in the sex life. But the fixation of the sex impulses in particular forms of expression must be acquired in the experiences of the individual. The most powerful factors in determining sex perversions are the circumstances under which the first sexual awakening occurs or the first sexual acts are performed. Once the direction has been determined in abnormal ways future sex impulses are likely to be shaped along these lines. The more frequently the abnormal impulse gains expression, the more does the perversity become fixed. Normal forms of sexual relations lose their attractiveness for the individual. They may be carried through, but the personal satisfaction of the perverted individual is absent or less gratifying than that of his abnormal interest. Grossly cruel or disgusting sexual expression may not be acquired in this form at their beginnings, but grow out of other abnormal tendencies present in the early development of the sexual interests.

Sadism is an aggressive sexual act that takes the form of causing physical injury or pain to the partner in the sexual act or the mutilation of their bodies. Not infrequently it finds expression in murders with mutilation of the body in particularly horrible ways. Crimes like those of Jack the Ripper and the not infrequent murders of children are sometimes of this class.

Masochism is of less importance in its relations to others than to the individual himself. It is expressed in the form of self-injury either personally inflicted or by a partner in a sexual act. Sexual satisfaction is obtained only through experiencing physical pain. The question of whether sadistic or masochistic impulses are to be regarded as irresistible impulses must be answered as it relates to each individual case. When these exist experience shows that there are probably other abnormal traits which mark the individual as one of pathologic constitution. They are frequently accompaniments of definite psychoses, such as epilepsy and paranoid forms of mental disorders. The existence of a psychosis at the time of the act would justify the conclusion that the impulse was irresistible. The greater the degree of variations from normal mental constitution and functioning, the less is the capacity for resistance.

The existence of an abnormal sexual impulse such as sexual perversion has a far-reaching influence upon psychic functioning in its relation

to the determination of character and the capacity of the individual for maintaining a normal mental adjustment to the responsibilities of life. Failures in adequate handling of sexual impulses of abnormal quality on the part of an individual may lead to the development of a psychoneurotic disorder or a definite psychosis.

Of less importance in its forensic relation than sadistic and masochistic perversions are those that are associated with "fetichism." In its usual application this term designates an abnormality of the sex impulses in which sexual excitement and gratification are only possible or are increased by having near the person some object, usually of apparel, in some way connected with the female body. Like other abnormalities of sexual impulses this perversion has transitions from tastes and habits that are not infrequently used among normal individuals to increase sexual gratification such as the attractiveness of perfumes, the arrangements of dress or peculiar ways under which the sexual act is performed. Fetichism has its chief forensic importance as it bears a relation to injuries inflicted upon others or stealing objects that are to be used as fetiches.

Abnormal sexual impulses frequently take the form of a need to expose the body or sexual parts to secure sexual gratification. This action is designated as exhibitionism. It is a form of sexual perversion that often comes in opposition to the laws against indecency and is sometimes associated directly with acts of sexual aggression. The impulse to expose may be to obtain sexual excitement from the action itself or from the satisfaction that is gained from observing its effects upon others. It is a perversion that is frequently observed among the feeble-minded or insane, especially in epilepsy and senile deterioration. In epilepsy it is commonly associated with episodes of unclear consciousness. The exposure may be made under circumstances that make it difficult to judge as to its perverted quality, such as in careless and public acts of urination. Usually it is carried out with stealth and a seeming appreciation of its criminal quality. When it is done publicly and without regard for consequences it is usually associated with an acute disorder of consciousness.

The frequency of the association of exhibitionism with mental disorder is shown in the study of Seiffer, who found among 85 instances of exhibitionism that 18 occurred in epileptics, 17 in those who were demented, 8 were neurasthenic, and 8 were alcoholic. The remaining 21 showed various other abnormalities. This association of exhibitionism with mental disorders demands that a thorough psychiatric examination be made of the accused in each instance. If disorder of mind be present then the individual has the status of one who by reason of mental diseases is impaired in his capacity to judge the nature of the act or so incapable of opposing, by normal inhibitions, the impulse to the act that it should be regarded as one of irresistible quality.

Much forensic interest centers in those sexual abnormalities that are expressed as homosexual or contrary sexual acts. As in other perverted sexual impulses, it becomes important for legal consideration only when



it leads to disorders of conduct that are against public decency or disturb the rights of others.

A single or an occasional sexual relation between those of the same sex does not in itself characterize an individual as being homosexual. This not infrequently occurs among individuals who also experience pleasure in heterosexual relations. A true homosexual is one whose sexual impulses are directed solely toward those of the same sex and who is indifferent or has an aversion to heterosexual relations.

Pederasty and homosexuality are not identical. Often pederasty is practised as a result of lack of opportunity for heterosexual relations, as among soldiers, prisoners, and those away from contacts with women. Such individuals are often normal in their heterosexual interests.

Whether contrary sexual impulses are of congenital origin or are acquired is a question impossible of decision at this time. The frequent association of homosexual impulses with abnormalities of body structure and physiologic functions seems to show that in many instances the homosexuality may be determined by inherited or by congenital influences. On the other hand, it is important to bear in mind the frequent determination of the lines along which sex impulses will develop by early experiences. The more common of the physical abnormalities are observed in the body contour, abnormalities of the secondary sex characteristics, the width of the larynx, and the quality of the voice. Commonly there are congenital abnormalities of the nervous system and frequently it is in relation with mental defectiveness. On the other hand, individuals of extraordinary talents have been homosexuals.

The form in which homosexual impulses express themselves may be in ways that are grossly sexual in quality or in actions that may attract only the attention of those familiar with such conditions.

Homosexual impulses apart from their direct relation to acts of sexual aggression are of importance as influences that produce serious problems for the individual to manage successfully. The psychogenic influences growing out of the struggle with homosexual tendencies may lead to character abnormalities or to the development of definite psychoses. They not infrequently produce depression and suicide. Commonly homosexual conflicts have a determining influence upon the development of psychoneurotic reactions and even acute disorders of consciousness. In their effects upon others they sometimes are directly related to acts of homicide. This usually occurs when the homosexual is about to be separated from one on whom the affections are fixed or with whom he has had sexual relations.

In their relation to the civil laws those who are homosexual have difficulty in successfully adapting themselves toward marriage, and they not infrequently are the direct or indirect cause leading to divorce or separation.

The opinion as to whether a homosexual impulse in a forensic situation was irresistible must be based on the factors present in each individual case. In itself a homosexual impulse cannot be regarded as irresistible. It becomes so when by reason of the existence of feeble-

mindfulness or definite mental disease, at the time of an act in question, the capacity of the individual to reason correctly as to the nature and consequences of the action is excluded. The impulse acquires an irresistible quality when by frequency of repetition and by deterioration of character normal resistances cannot be interposed.

The true homosexual is one who cannot become normal in his sex impulses and as such may be a menace to the community. On the other hand, there are large numbers of those who are homosexual and who show no defect of intelligence who handle their abnormal impulses in adequate ways and who do not interfere with the rights of others or social conventions.

The problem that is presented to the psychiatrist in the consideration of the forensic aspects of an abnormal impulse is to give his decision as to whether or not the impulse that leads to an action in question was one that was irresistible and hence would relieve the accused individual of his legal responsibility for an illegal action. The proof that an impulse is of abnormal quality is not proof that it was irresistible. It must be supposed that many an abnormal impulse does not lead to action. It is not probable that the abnormal act of which one may be accused was the first expression of that individual's abnormal impulses. Many of these must have previously been resisted. Each individual case must be judged by itself. The capacity to resist is a relative matter and must vary with conditions of health and disease, both physical and psychic. It is possible for one who suffers from abnormal sexual impulses to have in full health such low limits of capacity for resistance that any lessening of this by disease or any intensification of the stimulus, such as may occur from particular situations, may make the impulse irresistible. The question will come up as to whether this failure of resistance was one that the law recognizes as incapacitating the individual for legal responsibility. Here the only problem that is presented is whether or not there exists in the individual such a defect in intelligence as to prevent development of the inhibitions possessed by the normal man or whether there existed at the time of the action a disorder of mind that made it impossible for the individual to utilize the inhibitions that the normal mind is assumed to possess. If either defect of intelligence or mental disease is shown to exist, then it may fairly be assumed that the impulse was irresistible. Abnormal sex impulses are commonly characteristic of those who belong in the class of psychopathic inferiority. Often the qualities of mind that distinguish the psychopathic personality are combined with various physical abnormalities and then distinguish a type of individual who is classed as a "degenerate." The position before the law of the psychopathic personality and "the degenerate" is generally regarded as different from that of the insane. Individuals of these types are definitely abnormal and by reason of this mental difference should not be judged by the same standards as those applied to the healthy normal man. Their relation to questions of personal responsibility is a matter most difficult to decide.

## COMPULSIVE IDEAS AND COMPULSIVE ACTIONS

In certain abnormal mental states the course of thought is disordered by the presence of ideas and thoughts that force themselves into consciousness against the will of the individual. Such ideas are designated compulsive ideas or obsessive ideas. "They are not primarily dependent upon disordered intelligence nor do they arise directly as a result of emotional disturbances. They are always recognized by the patient as pathologic and as foreign to his usual consciousness" (Westphal).

In many instances the ideas may occur as feelings of being compelled to carry out a certain action. Such ideas are called compulsive impulses. If the ideas lead to actions such actions are designated as compulsive.

Compulsive ideas differ in many essentials from delusions. In contradistinction to delusions, compulsive ideas are always recognized as abnormal. They do not come from processes of reasoning, and while they interfere with normal processes of thought they do not falsify this in delusional ways. The judgment is not impaired unless there is also present a definite psychosis or defect in intelligence. Those who have delusions make no effort to free themselves from their ideas, while those with compulsions make every effort to get away from their troublesome thoughts. Not infrequently compulsive thoughts are intermingled among delusions. Thoughts that have for a long time been compulsive may later be elaborated into delusions. In some psychoses compulsive ideas are more or less conspicuous, especially in the depressed phase of manic-depressive insanity and in dementia præcox.

Compulsive ideas occur in many different forms and usually they are without serious influence upon conduct. They may occur in the form of names or words that appear in consciousness without any relations to thought at that moment. Often these are obscene or profane words. Many compulsive ideas are essentially of the quality of fears, and among this class are sometimes placed those peculiar obsessions or dreads that are commonly classed as phobias. The basis of the phobia is usually a feeling of anxiety that always arises in the individual when he is in certain particular places. He dreads to get into those situations that might make possible an attack. Among the more common forms of these are the fear of crossing a street or open places (agoraphobia); the fear of closed places (claustrophobia); fear of high places (acrophobia); fear of becoming contaminated or of dirt (misophobia). The compulsion sometimes occurs as a feeling of need to count as one carries through some action or to raise questions about various matters that are difficult to solve (interrogative obsessions, Grübelsucht). All of these compulsions, if resisted, produce feelings of tensions or anxiety that so distresses the patient that he finds it easy to yield to their insistence. So long as the compulsions are limited to thoughts that are not connected with tendencies to action they are of little forensic importance except as they indicate the abnormal mental constitution of the individual.

In many instances the compulsions are ideas that call for expression in various actions. The mildest forms are the compulsion to touch



various things as they go about, to count objects or their steps in walking. Most of these actions are quite harmless to others, but they produce oddities of behavior and if resisted produce much distress. Many compulsive impulses to actions concern acts that might, if carried out, have serious consequences. While theoretically these seem to have possibilities that might have forensic interest, experience has shown that only very rarely do they come in conflict with the laws. The more common of these compulsions are the feeling that they must steal, or injure someone by stabbing or shooting, or set fire to a building. Often these thoughts center on hurting or destroying their child. Sometimes the compulsions are of sexual character, a fear that they might expose themselves or commit some act of indecency. The patient appreciates the serious consequences of such actions and suffers much from anxiety and tensions in his efforts to keep from carrying them out. They often take precautions to prevent this. They destroy knives or whatever they fear they might use. They keep away from places or people that might provoke actions.

In almost all cases in which compulsions have lead to harmful actions it has been found that the patient lacks normal intelligence or has a definite type of psychosis. In some instances such actions have been carried out in reaction to a hallucination.

While individuals who are normal may occasionally have compulsive impulses to do unusual acts, such as to cry out in a crowd, throw themselves from a window, etc., these are always momentary and soon fade away. But, where they are persistent, it is an indication of a psychoneurotic or psychopathic type of constitution.

Compulsions may come on in states of fatigue or after some emotional disturbance or exhausting disease and disappear when the general health improves. In many instances they appear in various forms in early childhood and continue through life.

The fact that the judgment of the patient is not disturbed and the character of the emotional abnormalities distinguishes the individual as one who is not insane in the legal sense.

The abnormal character of the thought processes of one who has compulsions would raise doubts as to his capacity for full mental responsibility. The pathologic character of the individual with compulsions becomes more clearly evident when it can be shown from his statements that he made extraordinary efforts to resist these, and when these resistances were accompanied by physical disturbances that may have been observed by others.

## CLINICAL FORMS OF MENTAL DISORDERS

### MENTAL DISORDERS WITH SOMATIC DISEASES

It is not uncommon to find mental disturbances of varying degrees of severity associated with physical diseases, especially those classed as infectious diseases or those due to disturbances of the normal metabolic functions of the body.

These may in part be due to the high temperature incident to these disorders or to the influence of toxic substances formed during the disease process. They may also occur as a consequence of the severe nervous and physical exhaustion resulting from severe and prolonged illness. Clinically these disorders occur in various etiologic relations and in states showing differences in intensity and prominence of the various mental abnormalities.

They all have certain features in common. These are the disturbances of perception, difficulties in thinking, impaired comprehension, with varying prominence of unclearness of consciousness and hallucinations. Usually there is more or less motor restlessness or excitement present and the actions are disordered by the mental confusion and varying emotional states.

**Fever Delirium.**—In states of high temperature usually associated with infectious diseases delirium is not uncommon. In the mildest degrees of the delirium the symptoms may be those of a general restlessness with increased irritability and disinclination to carry on their usual work. The sleep is impaired and often broken by unpleasant dreams.

In a more severe degree the consciousness loses its normal clearness, hallucinations, largely of visual character, trouble the patient, and the thought is disturbed by vivid ideas of a phantastic and terrifying character. There is motor restlessness at times increasing to excitement. The behavior and attitude is usually much influenced by the apprehensive mood and the disordered comprehension and thought. In still more severe degrees of the disorder the symptoms are more intense and the motor disturbances are more prominent. Not infrequently these lead to harmful acts, such as suicide or injury to others. In a still more intense degree the consciousness is profoundly disordered, and the actions are uncontrolled and aimless. This stage generally terminates in coma and death.

**Infection Delirium.**—This occurs either as a state of delirium preceding the appearance of the somatic evidences of an infectious disease (initial delirium) or may develop later on in the course of the disorder. Its occurrence seems to be largely apart from the influence of temperature and more dependent upon the toxic effects of the disease. It occurs in association with typhoid fever, smallpox, influenza, bacterial septicemia, and chorea. In many instances the physical symptoms definitely suggest an infectious process, but the causative agent may be uncertain.

The mental symptoms are largely those of confusion with difficulty of comprehension, prominent hallucinations and poorly elaborated delusions that show the influence of a dominating apprehensive emotional state. There is motor restlessness and often brief outbursts of excitement. The attitude and conduct are largely governed by the apprehensiveness and unclear comprehension. This may lead to harmful actions either against the self in attempts at suicide or injury to others.

**Collapse Delirium.**—There sometimes occur in the infectious diseases or after some physical exhaustion delirious states of very acute

development and of brief duration. In these there is extreme confusion, phantastic hallucinations, flight of ideas, and changing emotional states. With these there is marked motor excitement of aimless type. During the height of the disturbance sleep is abolished and the general nutrition much impaired. If death does not occur from the associated physical disease, the delirium passes away after a duration of from a few hours to one or two weeks.

It has been most frequently observed in pneumonia, erysipelas, influenza, and sometimes in articular rheumatism. Its cause seems to be the continued influence of exhaustion and the toxic effects of the disease of which it is a part.

**Acute Confusional Insanity (Amentia).**—In the course of the infectious diseases and sometimes in association with toxemias and metabolic disorders there may develop a mental disorder less acute in its symptomatology than the infectious delirium. It may come on as the fever subsides. Its chief characteristics are the unclearness of consciousness, confusion, hallucinations, and changing delusions. The emotional state is variable, sometimes depressed and anxious, and in other instances mildly euphoric. The patients are restless, but rarely show any severe degree of excitement.

The disease usually begins with prodromals often extending over a few weeks. These are largely complaints of indefinite somatic discomforts and nervous disturbances. Thinking becomes difficult and the patient is unable to form a clear understanding of his situation. Hallucinations, either visual or auditory, are commonly numerous. Orientation is usually lost. The disorder continues at its height for weeks or months, and ends in recovery when accompanying physical disturbances do not prevent.

As causes there have been noted most of the infectious diseases, chronic nephritis, puerperal states, and rheumatic fever.

The differential diagnosis of this disorder often presents difficulties chiefly in its separation from schizophrenia.

**Postinfection Mental Weakness.**—Normal mental capacity may occasionally be much impaired for some time following an infectious disease. This may show in abnormalities of the emotions, difficulty in thinking clearly, and fatigue even on slight mental or physical exertion. Comprehension is clear and orientation is not disordered.

In rare instances, especially after typhoid fever, permanent mental deterioration may occur.

The treatment of this group of disturbances is chiefly that of the physical disease of which they are a part. In the more acute delirious states much good can be accomplished by prolonged warm baths and carefully administered sedatives.

The forensic importance of this group is probably slight. Occasionally murder of the child of a woman may occur during the mental disturbance associated with the puerperal period. Suicide is not infrequent in the delirium of typhoid fever and less frequently in some others of the infectious diseases.



## MENTAL DISORDERS FOLLOWING HEAD INJURY

Most of the mental disorders directly or indirectly following injury to the head belong among the psychoneuroses. Their effects work among the feelings and ideas of the patient to produce numerous subjective complaints and varying degrees of disabilities. These disorders are generally classed as traumatic neuroses or traumatic hysteria and their forensic relations are considered elsewhere in this book.

The true traumatic psychoses occur when the physical conditions within the central nervous system have been so disturbed that normal mental function is not possible. The immediate effects of this may be to produce total unconsciousness or varying degrees of unclearness. The brain may or may not show gross evidences of injuries, such as hemorrhages, tears, or loss of substance. When no gross evidences are discernible the underlying pathologic process may be edema of the nervous tissues, disturbances among the vascular relations, or in finer disarrangements among the nervous elements. The immediate effects soon pass away or may be followed by a variety of psychotic disturbances.

Adolf Meyer in a study of the traumatic psychoses has given the following classification of types:

1. **Posttraumatic Delirium.**—These are delirious states that follow the immediate deep disturbances of consciousness after the injury. As far as symptoms are concerned traumatic delirium cannot be differentiated from several other forms of delirium such as occur from toxic causes or in senile insanity. This may continue for several weeks and then return gradually to normal. Kraepelin mentions that residuals from the delirium may sometimes continue for six months.

2. **Posttraumatic Constitution.**—Following an injury to the head there may be a more or less lasting change of character. This shows as unstable emotional balance, tendencies to outbursts of irritability, excessive reactions to alcohol or physical illness, and often a decrease in the general intellectual efficiency of the individual.

3. **Traumatic Defect Conditions.**—The effects of the injury may be such as to produce an organic type of mental deterioration. With this there usually occur various focal neurologic disturbances such as paralyses, aphasia, or epileptic disorders.

4. **Psychoses in Which the Head Injury is Merely a Contributing Factor.**—Any of the more formal types of psychoses may be precipitated by the head trauma. The more common of these are general paresis, manic-depressive insanity, and dementia præcox.

Conflicts with the law largely are limited to the posttraumatic constitution type. The irritability occurring in this may lead to outbursts of anger and physical assaults that may be serious. These usually occur when the individual has been indulging in alcohol. The reactions then take on the character of the pathologic alcoholic intoxication.

The individual who has had a head injury, the effects of which have produced definite changes in his constitution, is not to be judged in respect to responsibility, when he has taken alcohol, by the same standards as the normal man. His resistance to the effects of alcohol have been

lowered, and amounts that he may have previously taken without harm now produce excessive and definitely pathologic reactions.

## MENTAL DISORDERS CAUSED BY ALCOHOL AND DRUG INTOXICATION

### ALCOHOLIC MENTAL DISORDERS

The mental disorders produced by the effects of alcohol may be of acute or chronic type.<sup>1</sup> The acute alcoholic disorders are characterized by more or less marked disturbances in the perceptions and comprehension; the production of abnormal emotional states and a lessening of the normal inhibitions to the impulses of the will.

The intensity and duration of these disorders depends much upon the quantities and strength of the alcohol taken and upon individual differences in susceptibility to its effects. Measurable differences from normal mental functioning may occur after amounts as small as 7 or 8 gm. (Kraepelin). Differences in the way individuals react to the effects of alcohol depend much upon the presence of constitutional mental and nervous abnormalities either inherited or acquired, or upon transitory changes in the physical and nervous health.

The acute toxic effects of alcohol are seen in the mental disturbances characteristic of ordinary alcoholic intoxication or common drunkenness. While the medicolegal relations of acute intoxication are essentially different from the other forms of mental disorder produced by alcohol, as far as they bear on the question of responsibility, nevertheless this condition has many of the characteristics occurring in well-defined psychoses. It has been called "an artificially produced insanity of the most acute type and best prognosis."

The earliest effects of alcohol upon psychologic processes occur in disturbances of the normal perceptions. These lead to inaccuracies and illusionary interpretations of what the individual sees and hears. The understanding is less clear than normally and wrong conclusions are easily formed. The capacity for mental work is impaired, and while the output may seem to be increased, its quality is inferior.

In the beginning of alcoholic intoxication the individual has a feeling of comfort and well being. All degrees of this occur up to the most boisterous and unrestrained happiness. His good humor is intermixed with irritability and passes over into a stage in which he is quarrelsome and shows outbursts of anger. He loses the normal appreciation for finer emotional relations and becomes coarse and vulgar, often showing increased sexual excitability. His attention becomes distractible. The thought becomes flighty and ideas are chosen without regard for continuity or logical relationships. Judgment and conclusions are less critically formed and are much influenced by the disordered perceptions and comprehension. Ultimately the thought becomes more and more incoherent and gradually all evidences of thinking are obliterated as there develops a more or less deep stupor. The actions and behavior

<sup>1</sup> See chapter on "Inebriety."

are early influenced by the disturbances in the other psychologic fields and by the diminished inhibitions to the normal impulses of the will. The alcoholic individual becomes more active and his movements are less deliberate and well directed. His speech becomes increased and boisterous. Gradually his control of movements becomes disordered. His gait and hand movements are unsteady and ataxic. His speech is thick and unintelligible and ultimately there is complete motor paralysis as the deep stupor comes on. The physical appearance is changed. The face becomes flushed and the superficial blood-vessels are injected, the heart-beat increased in frequency, and the blood-pressure is lowered. With the awakening from the stupor the acute disturbances have passed away. There is present, however, for some time mild feelings of illness and a permanently impaired memory for the period of the disturbed consciousness.

In spite of the seriously disturbed psychic functioning in acute alcoholic intoxication the law does not regard this as relieving the individual of his responsibility for his actions. The theory of this seems to be based on the assumption that the common experiences of every individual make him familiar with the knowledge that alcohol can deprive the average man of his ability to think clearly and to control his actions. Knowing this, the matter of his drinking becomes one of his personal choice, and for this he must be held responsible.

From a psychiatric viewpoint the individual under the influence of alcohol is no different from one mentally disordered by any other toxic agent. His insanity in quality and degree is comparable with any other psychosis. It has no essential difference from disordered mental states that occur in other psychoses that clearly relieve one of responsibility.

The matter of whether or not the intoxication was the result of the voluntary free will of the accused person is one that is outside of the province of the physician. His responsibility lies in showing the presence or absence of a pathologic mental state.

The diagnosis of acute alcoholic intoxication is usually not difficult. The diagnosis cannot be made solely from the objective symptoms. One must exclude pathologic mental disorders of consciousness occurring in organic brain diseases, such as tumor of the brain, epilepsy, and general paresis.

#### PATHOLOGIC ALCOHOLIC INTOXICATION

The medicolegal relations of acute alcoholic intoxication become different if the reactions of the individual to the effects of alcohol differ from those of the average normal man for whom the laws were made. Such conditions have been described under the terms pathologic alcoholic reactions, pathologic intoxications, or complicated alcoholic intoxications.

There are some individuals that show at times severe disturbances from the same amounts of alcohol that at other times could be taken without serious effects. These individual differences distinguish either different physical and mental states in the normal individual or are evi-



dences of an abnormal disposition that may have been inherited or acquired. This latter class often includes those who are of an epileptic type of constitution, psychopathic personalities, and those who have dementia præcox reactions. Transitory changes in dispositions to the serious effects of alcohol may be caused by whatever influences impair physical health, such as overexertion, loss of sleep, and exposure to excessive heat or cold. Some individuals may have but one such attack in their lifetime, while in others they are frequent occurrences. Even small amounts of alcoholic drinks may precipitate a severe attack. The beginning of the disorder is usually characterized by an outburst of anxiety or anger. This may be general or centered upon some particular idea or person. It commonly leads to assaults and physical attacks upon someone nearby. The orientation is usually lost and often there is wrong identification of persons. In some instances the excitement may come on immediately after awakening from sleep. The movements lack the inco-ordination usually present in ordinary intoxication. These pathologic states usually last a few hours and pass away after a deep sleep. There is generally a more or less complete amnesia for the period of the disturbance.

**Diagnosis.**—This is to be made on the severity of the anxiety, the disturbance of orientation, the impaired understanding for the surroundings, and the intensity of the motor disturbances. The degree of memory disturbance is not conclusive, as this also occurs in ordinary intoxication.

#### CHRONIC ALCOHOLISM (ALCOHOLIC DETERIORATION)

The chronic use of alcohol may produce pathologic changes in the physical, nervous, and mental health.

As physical abnormalities there occur dilatation of the superficial vessels of the skin, especially noted in the face and nose. The general nutrition varies between tendencies to obesity and severe marasmus. The heart commonly undergoes fatty degeneration. The stomach develops a chronic catarrh. The liver may become cirrhotic and the kidneys show characteristic alterations.

Among the nervous disturbances there are commonly tremors of the tongue and fingers. The pupillary reactions are often slowed and the tendon reflexes increased. There are various abnormalities in the sensibility, such as numbness or pains in the distribution of sensory nerves. The sleep is usually impaired and not infrequently there are convulsive attacks.

Among the mental symptoms occurring in chronic alcoholism the most noticeable are those in the emotional reactions. There is a marked instability in the moods and feelings. Ideas and behavior are more influenced by these than by normal deliberation and choice. There develops a characteristic impairment of the ethical feelings that shows in coarseness of character. This produces a lack of consideration for the sensibilities and rights of others and a lessening of the normal feelings of pride and shame that often leads to disturbances of public order

or definitely criminal actions. The dominating mood is one of careless euphoria that shows in the well-known good humor of the alcoholic.

These abnormalities of the emotions are causes of the weakness of will that is so marked in the actions of the chronic drinker. He acts as he feels. He is unable to stop drinking, neglects his business and family responsibilities, and often drifts into the ranks of the vagabonds or dependents.

The capacity for intellectual work progressively deteriorates. The cause for this lies in the lack of interest for what does not harmonize with his feelings and as a result of the organic changes that are commonly present in the central nervous system in chronic alcoholics. The memory is uncertain and much of the information they give is unreliable. The orientation is undisturbed.

Although true delusional formation does not occur, they show tendencies to form suspicions and allow their thoughts to be influenced by inaccuracies of perceptions. This makes the transition between simple alcoholic deterioration and alcoholic delusional states vague and ill defined.

The deterioration and the behavior of chronic alcoholism often produce situations and actions that raise the question of mental responsibility.

Rarely can the uncomplicated chronic alcoholic be regarded as so deteriorated as to be unable to distinguish between right and wrong in respect to his actions and would in most instances be held to have capacity for responsibility. The question is more difficult to decide when judged by his capacity to resist an impulse to commit an act. There can be no doubt but that the chronic alcoholic with evidences of mental deterioration is less capable of resisting impulses to act in the direction of his feelings than the normal individual. But whether this meets the requirements of the law as determining an irresistibility must be determined in each individual instance. Rarely do his actions seem to show the overpowering influence of the impulse that the law usually demands. As bearing on this question of irresistibility one must consider the act in relation with the degree of deterioration that may be present and the strength of the emotional factors involved in the circumstances under which the act was committed.

#### TRANSITORY STATES OF DISORDERED CONSCIOUSNESS

Those of chronic alcoholic habits occasionally have transitory states of unclear consciousness resembling those occurring in epilepsy. There may be no hallucinations and the emotional changes are not marked. Acts of violence sometimes occur during the episodes.

The fact that these actions may be in harmony with thoughts and feelings present during clear moments often makes the determination of responsibility difficult.

Moeli cites the case of a tailor who had been married for eight years. For several years he had been of an alcoholic habit and recently his drinking had increased. He neglected his work and had many quarrels

with his wife. The last few months he had shown a greatly increased irritability. The night before the act in question he slept badly. In the morning he brought a revolver home and told his wife he would now give her what he had long promised. When the wife attempted to take the revolver away he told her it was not loaded. As she left the room he wrote on a piece of paper that he wished to die, and turning the revolver on her he shot at her through a glass door. He left the house and went to the police station, where he appeared pale and excited. His hands and tongue were tremulous. In regard to the shooting he said he had acted in desperation. He smelled of alcohol, but showed no other evidence of drunkenness. Later on he had no memory for this examination, but had a vague recollection that he had shot. He did not remember writing the note.

#### DIPSOMANIA

There are individuals who at periodic intervals have an irresistible craving for drink and at other times may be abstinent or only moderate drinkers. These individuals suffer from affective tensions and ill humors that recur from time to time. Once finding relief for this by indulgence in alcoholic drinks there is easily established a habit. The alcoholism thus becomes a secondary feature to the fundamental abnormalities in the emotional reactions.

Their drinking is usually excessive and while under the influence of alcohol their behavior is often seriously disturbing and frequently comes in conflict with the laws. After a few days of hard drinking his usual mental state returns, leaving a more or less impaired memory for the episode.

The dipsomaniac is an individual with constitutional psychopathic traits. These are commonly evident in the intervals between drinking sprees.

#### DELIRIUM TREMENS (ALCOHOLIC DELIRIUM)

Acute delirious mental states not infrequently develop on the basis of chronic alcoholism. The onset of the delirium is often in relation with some somatic disorder such as pneumonia or an acute infectious disease. It occasionally comes on after physical injury or in states of greatly impaired nutrition. The acute outbreak of the delirious symptoms is usually preceded by a brief period of ill health in which there may be noticed restlessness, headache, mental depression, irritability, and usually gastric disturbances. In some instances the symptoms do not develop further and the condition may be looked upon as an abortive delirium.

The delirium is characterized by a marked prominence of hallucinations usually of visual type, but commonly intermingled with those of hearing and of the tactile sense; the subjects see animals, insects, reptiles, or curious objects around them. They hear noises, shots, or threatening voices. Usually the hallucinations have a terrifying quality that has a marked influence upon the behavior. The consciousness is not seriously disordered. They comprehend questions, hold conversations, and speak with an orderly flow of thought. There is, however, a complete dis-



orientation, in which they lose all knowledge of their location and ability to identify those around them.

As a rule they are overactive and often act as if busied at some purposeful employment. During the delirium sleep is usually abolished. After a few days the delirium passes off usually after a deep sleep. In other instances the symptoms gradually fade away. Memory for the period of the delirium is usually absent or greatly impaired.

The outcome of delirium tremens is usually good. Rarely the delirium persists for several weeks (protracted delirium). In some instances the delirious symptoms lessen, but there develops the characteristic clinical picture of Korsakow's psychosis. There are other cases in which as the delirium passes off permanent delusional states develop with delusions of persecution. In a considerable number of instances death occurs either from exhaustion or from intercurrent pneumonia.

The forensic situations usually developing out of actions of the delirium tremens patient are acts of violence against themselves or others growing out of their apprehensiveness caused by their hallucinations and impaired understanding.

#### ALCOHOLIC DELUSIONAL STATES WITH HALLUCINATIONS (ALCOHOLIC HALLUCINOSIS; ALCOHOLIC PARANOID STATES)

The characteristics of this clinical type of the alcoholic psychoses are the acute or subacute development of delusions of persecution usually on the basis of auditory hallucinations and an almost complete preservation of a clear state of consciousness.

The hallucinations usually appear suddenly, often in the night-time. The patient reacts to these with marked fear and anxiety. Everywhere he hears noises and remarks about himself. They accuse him of all sorts of misdeeds and threaten him with various dire consequences and plans for his punishment. Visual hallucinations may be present, but they are never as prominent as those of hearing.

These lead to the development of delusions of persecution and ideas of reference in which he gains the impression that others are talking about him and that various situations and actions have some relation to himself. The delusions take the form of terrible things that are going to happen to him or his family. Generally they have some degree of plausibility and seem to be efforts to explain what he hears in his hallucinations. Sometimes, however, they have a phantastic and absurd content and are made up of wierd and impossible material.

The emotional state is a mixture of apprehensiveness and the characteristic good humor of the chronic drinker. At times they show marked reactions of fear to the hallucinations and delusions, and again speak of the most terrifying experiences with indifference or even amusement.

Their behavior and actions vary between quite correct conduct and states in which their fears and delusions produce marked pathologic reactions. They try to escape from their persecutors, frequently change their employment, journeying from place to place, or in fear barricade

themselves in their homes. Not infrequently their desperation leads them to appeal to public officials for protection.

In a considerable number of instances the disorder from the beginning courses as a chronic paranoid disorder and ultimately leads to a characteristic mental deterioration. The hallucinations and ideas of reference remain even if the patient is abstinent. All sorts of ideas of persecution develop. Commonly these have an absurd and phantastic content. They are tormented by mysterious influences. They imagine that they are hypnotized, under the control of electric forces; that their thoughts are read, etc. The mood varies between irritability and episodic outbursts of anxiety and a more permanent indifference or good humor. The consciousness and orientation remain undisturbed.

In the course of time the patient becomes indifferent to his delusions and there develops a state of permanent mental deterioration.

#### CHRONIC ALCOHOLISM WITH DELUSIONS OF JEALOUSY

This type of alcoholic mental disorder is of much forensic importance, as it is often associated with crimes of a serious nature and not infrequently leads to murder or severe injury of the wife. The source of the delusions is largely in the domestic difficulties that occur between husband and wife owing to his alcoholic habits. Criticisms of his conduct by his wife and a natural difference in their harmonious relations easily leads the husband to develop suspicions as to the reasons for her attitude. It is only a step to the formation of the delusion that she has an interest in someone else. He looks for evidences to support his belief and finds reasons in all sorts of trivial circumstances. He spies on her actions and lays traps to catch her in compromising situations. Often visual and auditory hallucinations and illusions intermingle with his delusions and furnish additional strength for his convictions. He accuses his wife of sexual misconduct with one or many different parties. Some of these he may know, and this often leads to slanderous remarks and injury to those who are in no way concerned with his family affairs. He sees resemblances in his children to someone and forms the delusion that he himself is not their father. Usually there is an element of uncertainty or lack of absolute proof to his beliefs. He is never quite able to detect the wife in an unquestionable situation. The nearest he can get to a proof may be that he saw a shadow on the window or someone go out of the door or she seemed embarrassed when he confronted her. It is quite characteristic of this type of delusion that no matter how extensively it is elaborated it always is closely centered about the one idea of his wife's unfaithfulness.

The falsity of the beliefs of the patient is sometimes difficult to establish. The conduct of the patient often justifies the wife leaving her husband, and occasionally situations develop that make it easy to raise the suspicion of misconduct.

In support of the delusional quality of the patient's belief one must consider their improbability from knowledge of the character of the parties involved in the circumstances alleged, the slight and uncertain

evidence on which the beliefs are based, their intermixture with phantastic and obviously pathologic ideas, and the abnormally strong emotional hold that the belief has upon the patient.

As a rule the delusions become less troublesome when the patient is abstinent. In some instances the patient may recognize their pathologic quality, but generally they are never given up, the usual attitude of the patient being that he is willing to forgive and try to forget. The strong hold that the delusions have upon the alcoholic with his weakened will and usually more or less evidences of the chronic deterioration that occur in the chronic drinker not infrequently leads to severe attacks upon his wife that may result in physical injury or death. Occasionally the alcoholic may commit suicide either in relation with homicidal attacks or as a reaction to his troubled situation.

#### KORSAKOW'S PSYCHOSIS (ALCOHOLIC POLYNEURITIC PSYCHOSIS)

In the majority of instances the symptoms of Korsakow's psychosis develop following an attack of delirium tremens. Instead of the delirium clearing up after a few days, as is usual, the excitement subsides and the hallucinations tend to fade away. There persists, however, a more or less unclear consciousness, marked disorientation, and a severe impairment of the memory. It is the disorder of the memory that stands out as the most characteristic symptom of Korsakow's psychosis. The disturbance is especially marked in the retentive capacity. The patient forgets almost as quickly as he registers new impressions. Memories of the past are usually fairly well preserved. On the basis of this memory defect there develops a tendency to invent imaginary experiences and the patient romances about impossible things he may have done. This romancing may be spontaneous or brought out only on questioning. The emotional state is one of good humor and careless indifference; very rarely is there any marked irritability. Less frequently the disorder begins gradually without the preceding delirium, the emotional changes and memory disturbance being the first symptoms to attract attention.

Usually, but not always, the mental disorder is accompanied by the neurologic symptoms of multiple neuritis. These show as pains or feelings of numbness in the course of peripheral nerves, especially those of the extremities. Muscular power is diminished and nerve conduction is lessened. The tendon reflexes are decreased or disappear. Various atrophies of the muscles and permanent paralyses are common as residuals.

A considerable number of the cases make a fairly good recovery. Some are even able to return to their former employments. The majority, however, develop a greater or lesser degree of deterioration of the organic type. A few cases terminate fatally from heart failure or the effects of paralysis of the vagus nerve.

Anatomically there seems uniformly to occur degenerative changes of the nerve-cells of the central nervous system, especially in the motor cortex. The type of this degeneration is that caused by an injury to the



peripheral nerve-fibers. The peripheral nerves, depending upon the stage of the disorder, show parenchymatous degenerations. Multiple small hemorrhages in the deep central substance of the midbrain have been sometimes noted.

The forensic symptoms of Korsakow's psychosis are slight. The memory disturbance and the tendency toward confabulation may occasionally have some bearing on testamentary capacity.

#### ALCOHOLIC EPILEPSY

Alcohol aggravates chronic epileptic states and increases the frequency of attacks. It also has a tendency to precipitate epileptic attacks in those having predispositions to this disorder. Many attacks of late epilepsy develop in connection with chronic alcoholism. Typical epileptic attacks are not infrequent in alcoholic mental disorders. They occur especially in acute alcoholism, delirium tremens, dipsomania, and Korsakow's psychosis. In some of these the attacks seem to be due to the direct influence of the alcohol, the patient only having attacks when under the influence of alcohol.

In alcoholic epilepsy there is usually present the characteristic evidence of alcoholic deterioration apart from the epileptic phenomena. In alcoholic epilepsy Kraepelin finds that the attacks are not very frequent, but when they occur are of great severity.

The forensic relation of alcoholic epilepsy occurs largely in connection with acts of violence committed during acute confusion and when influenced by terror and hallucinations.

#### FORENSIC RELATIONS

The question of capacity for mental responsibility for criminal actions committed under the influence of alcohol is made difficult owing to the position that the law takes in respect to personal responsibility for the use of alcohol.

The psychiatric expert can show only whether or not a degree of mental disturbance existed at the time of an alleged action that robbed the individual of the capacity to reason normally according to his conduct and its effects. How and under what relations this disturbance was produced is a matter for the courts to decide.

Whenever the mental disturbance is that of a well-defined psychosis the question of capacity for responsibility is not difficult to decide. Actions committed in states of unclear consciousness from the acute effects of alcohol from a psychiatric viewpoint are not different from actions committed in other states of disordered consciousness from any other cause.

If the reactions of the individual to the influence of alcohol are different from the average normal individual with similar amounts and under like situations then there arises a definite psychiatric problem. If there exists a condition of pathologic intoxication then the individual cannot justly be judged for his actions as if he were a normal man. Alcoholic intolerance varies greatly in different individuals and in the

same individual under different circumstances. What the bearing of this is upon the question of responsibility in a particular individual is a matter for the courts to decide. This question of the personal factor in respect to alcoholic intolerance comes up often in relation with the acute mental disturbances in individuals who have constitutional mental abnormalities that in themselves do not relieve of capacity for responsibility, such as states of mental defectiveness or constitutional psychopathic inferiority.

The question of responsibility is difficult to decide in transitory states of disordered consciousness in those who show chronic alcoholic mental deterioration. In this condition there exists an unusual irritability that makes it easy to come into conflict with the laws much more so than in the case of the normal man. This likelihood is increased under the acute influence of drinking. Transitory states of unclear consciousness frequently occur in which the individual is incapable of reasoning. Actions may be committed in these states that were planned in states of irritability preceding the unclear period and thus have an appearance of deliberation and planning that suggests responsibility. But this cannot be taken to indicate that a state of disordered consciousness was not present at the time of the action.

No definite general rule can be laid down for guiding the formation of the opinion of the expert as to the question of capacity for responsibility for action of the chronic alcoholic. Each case must be judged by itself in relation with the presence or absence of constitutional abnormalities in the individual and the intensity and pathologic quality of the reactions.

Occasionally acute alcoholic disturbances may be indirectly the result of an existing psychosis such as general paresis or manic excitement. In both of these disorders it is not uncommon for the individual to develop alcoholic habits or to increase those already present.

#### MENTAL DISORDERS FROM MORPHINISM

The more common psychiatric problems produced by the effects of morphin are almost exclusively concerned with its continued use as a habit drug. The chronic use of morphin produces a characteristic lessening of the capacity for continued mental work and an increasing fatigability. The memory becomes uncertain. The patient develops a marked tendency to lie not only regarding his drug habits, but is notoriously unreliable in other directions. He shows marked emotional variability. When under the influence of the drug he has a feeling of comfortable euphoria, appears bright and alert, shows a tendency to flightiness, and subjective discomforts disappear.

It is characteristic of morphin that the individual soon acquires a tolerance for the drug and that its quieting effects can be kept up only by a progressive increase of the dosage. The dosage varies between minimal doses of usual medicinal size to amounts of 1 gram or over per diem. Amounts as high as 20 grams per diem have been observed (Bleuler).

Abstinence from the drug produces characteristic disturbances that commonly present acute conditions for psychiatric consideration. These show in times when they are unable to procure the drug and during the usual withdrawal treatment carried on in hospitals and sanitarium. The severity of these disturbances depends upon the amounts taken and the length of time the habit has been present. They are also much influenced by the constitutional abnormalities of the individual. During this period he is restless, tense, and suffers from distressing anxiety.

Most drug addicts are psychopathic types of personalities and show permanently the characteristics of this class. It is always difficult to distinguish how much of the anxiety and instability is due to the deteriorating influence of the drug and how much to the underlying psychopathic traits and psychoneurotic reactions.

Morphin users suffer from a variety of physical and nervous complaints. Many of these are subjective, but others are evidences of disturbed organic functions. They complain of indefinite pains in various parts of the body, of peculiar sensations, and cardiac palpitation. Those who have used the drug for a long time have a characteristic ashy-pale color of the skin and the surface of the body commonly shows the scars from the use of the hypodermic needle. They suffer from attacks of diarrhea and constipation. The sexual potency decreases and menstruation is often abolished.

When the drug is removed there is uniformly a marked restlessness and tension with feelings of anxiety. Their subjective complaints of pain increase. The heart action often becomes disturbed and there is usually more or less severe diarrhea. The stomach is unable to retain food and sleep is greatly impaired. Occasionally during abstinence attacks of delirium with unclear consciousness occur. After a few days the more distressing symptoms pass away and convalescence is usually rapid.

The outlook for permanent cure is discouraging. A considerable number of cases get well, but the majority return to the use of the drug.

The diagnosis of morphinism may be easy when one knows the history of the patient and the body shows the scars from the hypodermic injections. In other cases the use of morphin may be suspected from the history of the behavior of the patient and his general appearance and reactions.

Treatment can be best carried on in a sanitarium or hospital. The only effective treatment is the withdrawal of the drug and encouragement and supportive measures during the period of abstinence.

The chronic user of morphin often comes in conflict with the laws. In most instances their offense is stealing or swindling in order to secure the drug or means to procure it. From a psychiatric viewpoint it would seem that the morphin user tormented by the anxiety and mental abnormalities of the abstinent period was one who lacks the capacity for mental responsibility by reason of an overpowering impulse. The problem is much like that involved in some cases of alcoholism, notably dipsomania.



When acts are committed in periods of unclearness such as occur in abstinence delirium it would seem that there could be no question but that the individual lacked capacity for responsibility.

#### MENTAL DISORDERS CAUSED BY COCAIN

Cocain produces a mild excitement with increased flow of ideas and overactivity. It brings to the individual subjective feelings of comfort and mild stimulation. He has a feeling of increased capability that shows in unusual spurts of energy in more or less scattered directions.

The chronic use of the drug produces a characteristic mental and physical deterioration. There develops a chronic excitability and impaired capacity for mental work. The memory is inaccurate and strength of will and moral qualities are greatly weakened. The physical appearance becomes changed. The skin is pale and the face has a somewhat senile expression. The nutrition is greatly impaired, body weight falls, and the motor reactions are slow and weak. The heart-beat is often irregular and the pulse-rate increased. The pupils are dilated and the tendon reflexes increased. Excessive doses of the drug often produce heart failure and death.

The chronic user of cocain not infrequently develops a characteristic hallucinatory delusional state. The hallucinations are chiefly visual or tactile, less frequently auditory. The visual hallucinations have a peculiar microscopic quality. The objects seen are extremely small in size.

Occasionally there may occur brief episodes of delirious unclearness, but as a rule consciousness and orientation are unimpaired.

In some instances there are delusions of persecution or jealousy resembling those in chronic alcoholic paranoid states.

When not under the influence of cocain the patients are usually tense and suffer from anxiety that, finally becoming unbearable, drives them again to the use of the drug. As a rule shortly after the withdrawal of the drug the hallucinations disappear and the delusions gradually fade away.

The prognosis for permanent cure is more serious than in the case of the user of morphin. In both instances the outlook for cure is greatly influenced by the presence of an underlying psychopathic constitution. The effects of sudden withdrawal of the drug during treatment are far less troublesome than in morphinism. The user of cocain comes in conflict with the laws largely as a result of acts of violence committed under the influence of hallucinations or delusions or for stealing and swindling to which they are driven in order to secure the drug.

#### NEUROSYPHILITIC MENTAL DISORDERS (CEREBRAL SYPHILIS; GENERAL PARESIS; TABES PSYCHOSIS)

Syphilis is one of the most tangible causes for mental disorders that we know of and is the direct cause of from 8 to 15 per cent. of the annual admissions to hospitals for mental disorders in this country. Its causative influences work either through psychogenic ways or by a direct

involvement of the structure of the central nervous system. Occasionally an individual becomes obsessed by the fear that he has contracted syphilis. Careful examinations are unable to show its presence, but in spite of this the patient becomes worried and introspective. Such conditions belong clinically, for the greater part, among the psychoneuroses, while others are depressed states of the manic-depressive psychoses. These symptoms have a forensic importance only as they are a part of a definite psychosis or psychoneurosis.

In the early stages of infection with syphilis mental and nervous symptoms are not infrequent. These may occur as headaches or abnormal feelings in various parts of the body. Thinking and comprehension become difficult and the patient is abnormally irritable. Occasionally definite attacks of anxiety occur, especially in psychoneurotic individuals who have acquired syphilis.

Conditions such as these would rarely come in conflict with the laws by reason of harmful acts involving others. Occasionally suicide has been observed as a reaction to the knowledge of being infected. Their relation to capacity for responsibility would be judged, as they lower the general health of the individual and make him less resistive to emotional stresses that may be involved in trying situations.

#### CEREBRAL SYPHILIS (SYPHILITIC MENINGITIS; VASCULAR SYPHILIS, GUMMA)

Under the general title of cerebral syphilis are included several forms of syphilitic disorders of the central nervous system that are essentially different in their pathology from general paresis. While in the latter the process is more or less diffuse and extensively involves the nerve-cells and fibers of the brain, in cerebral syphilis the process is localized in the meninges, the blood-vessels, or occurs in the form of focal syphilitic tumors. All of these forms of cerebral syphilis are accompanied by prominent neurologic symptoms that owe their occurrence to the particular localization of the lesions. These symptoms are attacks of convulsions, transitory and permanent motor paralyses, and various disorders of sensibility. There are usually present abnormalities of the pupils and tendon reflexes.

The mental symptoms present in this group of disorders are quite the same as occur in a variety of organic brain diseases and are not specific for a syphilitic etiology. When the pathology is largely confined to the blood-vessels the symptoms closely resemble those occurring in cerebral arteriosclerosis. These are transitory attacks of dizziness, or disturbed consciousness, emotional instability, auditory hallucinations, memory impairment, and general intellectual deterioration. The attacks of disordered consciousness may last from a few minutes to several hours. Total loss of consciousness often occurs in relation with apoplectic-form attacks. As a rule individuals with cerebral syphilis also show disorders of the blood-vessels of the body and organic changes in the heart and kidneys.

As the disorder progresses the mental deterioration becomes more marked. Their capacity to think clearly and form correct judgments is

seriously impaired. Their outward conduct, apart from the states of transitory unclearness when their actions may be confused and badly directed, shows no serious disorder.

The mental symptoms produced by syphilitic gummata are quite the same as occur in intracranial tumors of other etiology. In part these are dependent upon the intracranial pressure produced by the presence of the tumor within the nervous system or its influence upon the flow of the cerebrospinal fluid. Other symptoms are of focal characters and dependent upon the particular localization of the gumma within the brain. These latter are largely neurologic disturbances, such as epileptiform convulsions, various motor and sensory paralyses, disturbances in the recognition of objects, in the ability to understand spoken or written language, or to speak correctly.

The diagnosis of cerebral syphilis is largely made upon the history of the infection and the evidences of syphilis as disclosed in the serologic examinations.

The forensic relations of the mental disturbances associated with cerebral syphilis are probably slight. During periods of disordered consciousness actions may be committed that are of criminal quality especially under the influence of hallucinations. The memory disorder that is usually present and the deterioration in the intellectual field must seriously impair their ability to reason correctly in relation with their responsibilities and actions or to have a full appreciation of all that is involved in business relations.

#### GENERAL PARESIS (GENERAL PARALYSIS OF THE INSANE; PARETIC DEMENTIA; PARESIS)

General paresis is a psychosis of organic type that accompanies a pathologic process of an inflammatory and degenerative character among the nervous elements of the brain and is specifically due to the effects of syphilis.

The mental symptoms are those of an organic deterioration with intermixture of affective disturbance and delusions, these being largely determined by factors inherent in the personality of the individual.

The neurologic symptoms depend upon the distribution of the structural lesions, and are due to defects from loss of brain substance or the irritative influence of the disease process.

**Mental Symptoms.**—General paresis is a disease having a progressive course and terminating with death either from the direct effects of the disease or from intercurrent causes.

The progress of the deterioration may be uniform or may be irregular owing to variations in the intensity of the pathologic process in the nervous system. It is not infrequently interrupted by temporary remissions in which the pathologic symptoms become less prominent. The symptoms of the disease are both mental and neurologic.

The first symptoms of the disorder commonly appear gradually, but frequently develop in relation with a sudden attack of disordered consciousness. Often the exact period of onset is difficult to deter-



mine. The earliest mental symptoms may show as indefinite changes from the individual's normal mental state. There may be an increased irritability or fatigue even in usual mental tasks. The prominence with which mental symptoms attract attention depends much upon the occupation and social position of the individual. Those working at tasks requiring mental efforts show symptoms much earlier than those engaged in physical labor. The most striking early symptoms appear in relation with memory. These show in a lessened capacity for retaining new perceptions. Names and details are easily forgotten. There are inaccuracies in fixing dates and memories in their correct sequence. What they used to trust to their memory they now must write down. As the disorder progresses their ability even to recall experiences of early life becomes impaired. Often this memory disturbance is accompanied by a tendency to confabulate and to give narrations of experiences that never occurred.

Abnormalities of the feelings and moods always occur as the progress of the disease advances. The finer emotional qualities of the personality are early affected. The patients lose their delicacy of feeling, and appreciation of the rights of others or regard for social conventions. They neglect obligations, the needs of their families, and business responsibilities. They often show extreme coarseness of character that leads to acts of indecency and sexual offenses.

There develop more or less permanent moods of abnormal qualities of feeling that distinguish varieties in types and course of the disorder. There are types in which the clinical course is characterized by a progressing dulness and emotional deterioration. There are others in which the mood is depressed and the thoughts are continually of sad quality. The most characteristic type of mood is one of euphoria or exhilaration. They show this in their appearance and behavior. They have a feeling of well being—"everything is fine"—nothing gives them discomfort, and their thought is concerned with expansive ideas and wonderful plans. Often there is more or less instability of moods and emotional reactions. Euphoric moods may be interrupted by brief episodes of sadness.

**Neurologic Symptoms.**—These are of varied character and are in direct relation with the localization and character of the pathologic process within the central nervous system. Various muscles or groups of muscles may be weak or paralyzed. Normal movements of the eyeball or face may be impaired. This sometimes causes a characteristic relaxation of the muscles of the lower half of the face and drooping of the angle of the mouth. In advanced stages of the disorder the muscles of the throat may be involved and swallowing becomes difficult or impossible. Not infrequently this results in death from obstruction of the air passages by food.

Many of the motor disturbances are symptoms of irritations producing spasms and symptoms of hypertonicity. These show as twitchings or tremors of various muscles, especially of the face and extremities. In this type tendon reflexes are increased.

Disturbances of speech articulation are characteristic symptoms of general paresis. These may be noticed in spontaneous speech or be brought out more clearly with test phrases requiring special dexterity. Tests commonly used to demonstrate this are words such as "electricity," "truly rural," and phrases, "third riding artillery brigade," "round round the rugged rock the ragged rascal ran." Some speech errors are due to psychic factors, such as inattention or forgetfulness and aphasic disturbances.

Similar influences produce disturbances of the handwriting. Often these occur very early in the disease and may be of great value in fixing the time of the beginning of the mental breakdown. The form of the letters may show the influence of tremors and ataxia. Their productions lack neatness. Syllables and letters may be misplaced or omitted. Sometimes there are duplications of strokes in forming the letters.

As the disorder progresses the intellectual capabilities become more and more impaired. Tasks that were formerly easy are done with many mistakes or are altogether impossible. In some instances, especially in the depressed forms, the patient has an appreciation of illness, but generally this is absent. Hallucinations occasionally occur, but only rarely do they have any conspicuous part among the clinical symptoms. Episodes of unclear consciousness are frequent during the course of the disease. These seem to stand in relation with the progress of the pathologic process in the brain. These occur in the form of attacks of confusion or bewilderment or as complete loss of consciousness.

One of the most characteristic features of general paresis is the disturbance in the processes of reasoning and judgment. This shows in a lack of critical consideration of their plans and actions and is in intimate relation with delusional elaboration. Delusions are commonly present and correspond closely to the dominating emotional states. The most characteristic delusions are those of expansive quality. Often these develop in relation with mild excitement. The form of the delusion varies much with the interests of the individual. There may be ideas of wealth or power, or exalted ambitions and phantastic schemes. They are, as a rule, changeable and usually disappear as emotional deterioration progresses. If the mood is depressed the delusions are usually self-accusatory in type or are complaints of some imagined physical disorder that often are most absurd in their possibilities. The depression is sometimes most intense and accompanied by anxiety and agitation. Suicide is not infrequent in the severe depressions. In the end stages of the disorder the mental deterioration is usually extreme. There is an absence of emotional responsiveness. The patient lies in a stupor the greater part of the time and all intellectual activity has disappeared.

The common syphilitic etiology of general paresis and tabes dorsalis not infrequently brings the clinical symptomatology of the two disorders together in the same case (taboparesis). The most prominent of the tabetic symptoms are observed in disturbances of sensibility and the reflexes. As abnormalities of sensation there occur feelings of

irritation or numbness in various parts of the body and extremities. Pain appreciation may be decreased or abolished. The muscle sense that gives knowledge of movement and the position of parts of the body may be impaired or absent. The result of this is to make it difficult for the individual to stand with eyes closed without falling, and the movements in walking and using the arms are uncertain and ataxic. The tendon reflexes are decreased or abolished. Among the earliest and most constant neurologic symptoms of general paresis are disturbances of the pupils. The most frequent of these are irregularities in the outline of the pupil or inequality in diameter. In about one-third of all cases (Weiler) there is loss of the normal narrowing of the pupil to direct stimulation with light, while the reaction to accommodation persists (Argyll-Robertson pupil).

A characteristic feature of general paresis is the occurrence of attacks of motor paralysis or transitory disturbances of consciousness. The motor attacks may be limited to twitchings and jerkings of groups of muscles or to convulsive attacks with loss of consciousness closely resembling those occurring in epilepsy. Not infrequently a number of attacks occur in rapid succession. The attacks of disordered consciousness vary from slight episodes of transitory unclearness to complete loss of consciousness. In many instances the attack comes on with suddenness and the individual falls to the floor as if he had had an apoplectic stroke. Loss of consciousness may be complete; the muscles may be rigid or relaxed and the breathing stertorous. After the attack ceases there commonly persists a weakness or paralysis of a group of muscles or an extremity. After a few hours or days this usually passes away.

There are other attacks in which consciousness is less severely disturbed. These may occur as momentary periods of confusion or slight unclearness. Speech may be lost for a brief period or the individual may show various oddities of conduct for a few moments.

As general paresis is always due to syphilis, a positive Wassermann reaction on the blood-serum is present in nearly every case. This signifies that the individual has syphilis, but not necessarily general paresis. This fact is abundantly supported by a vast amount of experience. Plaut found among 245 cases of general paresis that the blood-serum gave a positive Wassermann reaction in all but 2 cases. Edel in a series of 54 cases found a positive reaction in every instance. Southard and Solomon in their series of cases report a case of what seems very clearly to have been a case of general paresis, but the Wassermann reaction on the blood-serum was always negative. They quote the figures of Müller, who found in 386 examinations of general paresis that 379 showed all reactions positive, or 98.5 per cent.

The cerebrospinal fluid always shows pathologic changes. These vary during the course of the disorder and seem to be influenced by treatment. While normally the number of cells in the cerebrospinal fluid never exceeds 8 or 10, in 95 per cent. of cases of general paresis (Nonne) there is an increase over these numbers. The cells present are



almost entirely small lymphocytes. The cerebrospinal fluid of general paresis contains globulin in almost 95 per cent. of cases. Normally this is not present. The detection of this is commonly carried out by the Nonne-Apelt test either as originally given or by some modification such as that of Ross-Jones.

A positive Wassermann reaction in the fluid occurs in about 95 per cent. of cases of general paresis. This definitely indicates that the nervous system is involved in a syphilitic disorder, but does not signify that this is the process of general paresis. In organic disorders of the central nervous system there are certain substances that may accumulate in the fluid that precipitate gold when in a colloidal solution (Lange's gold sol reaction). The type of reaction when cerebrospinal fluid is mixed with colloidal solutions of gold in different dilutions depends upon the character of the pathologic process in the central nervous system. "Fluids from cases of general paresis will give a strong and fairly characteristic reaction, especially if more than one sample is tested, in the vast majority of cases" (for details of technic of Lange's test see Southard and Solomon, *Neurosyphilis*, p. 474).

**Physical Abnormalities.**—The weight varies much during the course of the disease. During excitement or severe depression the weight usually falls. As dementia progresses, especially when the mood is euphoric or one of emotional dulness, the weight tends to increase. During the end stages the patient is usually bedridden and shows severe disturbances of nutrition, often with contractures and various trophic disorders. Disturbances of the function of the bladder either in the form of pathologic retention or lost control of sphincters are frequent symptoms during the advanced stages of the disease. Fracture of the long bones are not uncommon, occurring either spontaneously or from trivial causes.

It is customary in clinical descriptions of general paresis to differentiate several types of the disorder. These have some significance in matters of relative prognosis and in relation to forensic problems. The distinctions between types is determined largely on differences in the emotional states.

**1. Simple Demented Type.**—This is characterized by a lack of prominence of either exaltation or depression. Delusions are not conspicuous. The course shows a progressive emotional deterioration.

**2. Expansive Type.**—This corresponds to what is commonly recognized as the classical form of the disease. The mood is euphoric. Delusions of a grandiose or expansive type are prominent symptoms. Usually there is an increased activity and not infrequently mood and conduct bring about forensic complications.

**3. Depressed Type.**—The mood is sad and there are usually delusions of a hypochondriac type or self-accusations.

**4. Agitated Type.**—This is the least frequent variety. It is characterized by intense excitement with confusion and usually hallucinations and illusions. The duration of the disorder is shorter than in the other types.

**Juvenile Paresis.**—Not infrequently general paresis occurs in children. The disease begins most commonly in the years of adolescence, but cases have been described as occurring as early as the age of five or six (Kraepelin). Usually these children have shown evidences of physical or mental abnormalities that antedate the onset of the parietic symptoms. The course of this type is that of a slowly progressing deterioration.

The neurologic symptoms and the serologic findings are the same as in adult types. Attacks of convulsions are frequent. The duration of the juvenile type is from three to four years. In about 80 per cent. of cases there are evidences of syphilis among the antecedents. Commonly the patients show symptoms and abnormalities of congenital syphilis, such as Hutchinson's teeth.

**Conjugal Neurosyphilis.**—Systematic examinations of the blood of mates of those having general paresis show a positive Wassermann reaction in the blood of the mate in about 32 per cent. of instances. In about 3.8 per cent. of cases the disorder of the mate is general paresis.

**Forensic Relations.**—In general paresis there is at some stage in the progress of the disorder a more or less marked impairment of those psychic functions that are involved in processes of reasoning. There is also a pathologic state of the emotions that seriously influences conduct and often results in actions and situations that are of forensic importance. These usually occur in the earlier phases of the disorder. As the disorder advances usually the mental deterioration is so great as to place the individual in a restricted environment either at home or in an institution.

It is probable that general paresis is more frequent among those coming before courts accused of crimes than is recognized. Mild mental symptoms often do not attract attention or are looked upon as mental or moral qualities common in the criminal class. This fact is shown in the frequency with which definite symptoms of general paresis develop in prisoners in jails and penitentiaries. While serious crimes are occasionally committed by those who have general paresis, the majority of offenses are those growing out of their defective judgment and loss of finer emotional qualities. Among the more usual crimes are criminal misconduct in business affairs, swindling or fraud, larceny, and criminal negligence. Sexual crimes of various sorts are not uncommon. These may be in the form of sexual assaults, often against children, or actions that are offenses against public decency. Occasionally the actions are committed during episodes of excitement, and in such instances there is usually an accompanying unclearness of consciousness. Often the occurrence of the act itself is an evidence of a mental disorder in the individual. Whenever one, especially in the mid years of life, who has always been upright in character, commits acts that are in marked contrast to his former habits, a suspicion of general paresis is justified.

The definite proof of the existence of general paresis is evidence that the individual is impaired in his capacity to reason normally regarding the nature and consequences of his actions. Even if there is definite

proof of the existence of general paresis at the time of arraignment of one accused of crime, the question must be answered as to whether this disorder was present at or preceding the time of the alleged action. It is sometimes most difficult accurately to fix the time of the onset of the mental abnormalities of the disorder from any testimony of witnesses. The development of the symptoms is commonly so gradual as to escape detection by even those most familiar with the life of the individual. Even if serologic examinations show the reactions of neurosyphilis, in periods antedating the action in question, this cannot be taken as evidence that the psychic symptoms of general paresis were present at that time. It is, however, definitely a proof of brain disease and as such must have a bearing on the question of capacity for responsibility. It would seem that experience does not at present justify the laying down of any general proposition as to the assumption that the serologic evidences alone implies the existence of impaired capacity for responsibility. Each particular case must be decided by itself. The matter becomes easier of decision if definite evidence, however slight, of mental abnormalities can be shown to exist. These may be no more than a slight increase of irritability, a greater degree of fatigability than formerly, or complaints of a neurasthenic type.

It is often possible to determine early phases of the disorder from specimens of the handwriting. If a diagnosis of paresis can be established at the time of examination, one is justified in assuming its existence at earlier periods if the writing shows tremors, elisions of letters or syllables, changes in grammatic relations, etc. This was shown in a case of general paresis that entered suit for damages against a street railway company for having caused his disorder. Following a slight jarring of the body caused by the sudden starting of a car the patient complained of various nervous symptoms that rapidly increased and in course of time led to his commitment to a hospital, where he later died with definite evidence of general paresis. It was possible to show in this case that his signatures to receipts and checks for a considerable period antedating the accident showed changes characteristic of the usual handwriting disorders of this disease. The fact that it is the rule to find slight evidences of mental abnormalities long before the existence of gross psychic disturbances justifies the assumption that the beginnings of the disorder usually are to be placed far earlier than the outbreak of symptoms directing attention to the disease.

Difficulties will sometimes arise in judging as to mental capacity during periods of remission of the mental symptoms of general paresis. It is not an uncommon clinical occurrence for the mental symptoms apparently to disappear, at least the most noticeable of these. Organic disturbances that have developed in the progress of the disorder nearly always persist during the remission. Individuals have been known to resume their former occupations during remissions even with success.

**Prognosis.**—General paresis is an incurable disease. A relatively small number of cases of the disease show remissions of the symptoms. In some of these the cessation of the progress of the disorder and abey-



ance of the more striking features suggests that the disease may have been cured. But there nearly always remain mild abnormal psychic residuals and neurologic disturbances. The length of a remission varies. As a rule, it does not last over a few months. Cases in which the patient remains apparently well for more than two or three years are to be considered as most exceptional (Kraepelin). The usual course of this disorder is a progressive mental and physical deterioration. Death occurs in the majority of cases within the first two years of the disorder. The average duration of the disease among male cases is twenty-eight months and twenty-four months for females (Julius and Arndt). Death may occur from intercurrent physical disorders or accident. The most frequent of these is pneumonia. This sometimes results from the aspiration of food into the air passages or from infections. The terminal phase of the disorder is marked by extreme physical wasting and lack of strength.

**Pathologic Anatomy.**—In all cases of general paresis there are present in the brain structural alterations that in type and distribution constitute a pathologic process that is of diagnostic value.

This process is a chronic inflammation of the membranes and vascular structures of the brain and degenerative and reactive changes among the nervous elements and neuroglia. Sufficient experience has accumulated to justify the assumption that in every case the *Spirochaeta pallida* is present among the nerve-cells and fibers of the brain. While the process is diffusely distributed throughout the brain, it is usually more intense in certain regions than others. As a rule, the frontal regions are most severely involved. The prominence of the gross and microscopic abnormalities depends upon the duration of the disease and upon the intensity of the process.

In most advanced cases of general paresis there are pathologic abnormalities that are visible in the gross. These are chiefly changes in the membranes and atrophies of the brain substance. The dura mater is frequently adherent to the inner table of the skull. Occasionally there may be hemorrhagic deposits on the inner surface of the dura. Almost without exception in advanced stages of the disorder the pia mater shows patchy or diffuse thickening, especially along the blood-vessels. Often the pia mater may be so adherent to the brain substance that this tears when the pia is removed. The convolutions of the brain are atrophied in all advanced cases. They are smaller; their surface often hummocky, and the separating fissures and sulci are widened and shallow.

The weight of the brain is diminished in proportion to the atrophy of its substance. According to Ilberg the brain of the male general paretic varies between 910 and 1549 gm. (normal weight 960–1800 gm.). Among women the weight varies between 802 and 1305 gm. (normal weight 880–1600 gm.). The ependyma of the ventricles, especially that of the fourth, often shows fine granulations. No one of the gross abnormalities of the brain is specific for general paresis. All of these occur in other organic disorders of the brain. The microscopic changes

are, however, characteristic for general paresis, and when taken in connection with the syphilitic reactions in the blood-serum and spinal fluid they are at the present time regarded as absolutely diagnostic. The only other disorder having a process at all resembling that of general paresis is that of African sleeping sickness, a disease produced by the effects of *Trypanosoma gambiense*.

The histologic changes are to be considered as they effect (1) the membranes, (2) the blood-vessels, (3) the nerve-cells and fibers, (4) the neuroglia.

(1) The pia mater is uniformly found to have in its lymph spaces varying numbers of lymphocytes and plasma-cells. Cells of other types are found only occasionally and in small numbers. When the process has been of long duration or of great intensity in the membranes the pia may show more or less increase in its connective tissue.

(2) The walls and lymph spaces of the blood-vessels contain lymphocytes and plasma-cells. A pathologic increase in the number of vessels is not infrequent when the disease process has been severe and of long duration.

(3) The nerve-cells and fibers undergo degenerative changes of various sorts. None of these seems to be specific. They may be entirely destroyed or persist in forms altered from normal.

(4) The neuroglia undergoes reactive changes in response to the disturbances among the nervous elements. When nerve-cells and fibers are destroyed there is an increase of neuroglia cells and fibers. The cells show a variety of types differing from those seen under normal conditions. As a rule, the body of the cells is large and the processes are unusually conspicuous.

Only when considered in its entirety can the pathologic process present in the brain be regarded as absolutely diagnostic of general paresis. No one group of changes is specific for the disorder.

While general paresis may be regarded as a form of neurosyphilis, it has essential distinctions from either tertiary lesions of syphilis, such as the vascular and gummatous forms and from tabes. In general paresis the process is distributed diffusely through the parenchyma of the brain, among the nerve-cells and fibers. In cerebrospinal syphilis the process is primarily confined to the connective-tissue structures of the blood-vessels and membranes. These may secondarily involve nerve elements, but even then the changes are different from those in general paresis.

Occasionally interstitial changes are combined with a general paresis process, but the two pathologic types are associated and not dependent.

The spinal cord in general paresis is frequently involved. The changes here may be degeneration in the lateral columns secondary to destruction of nervous elements in the motor cortex region, or they may be due to an accompanying meningovascular syphilis of the spinal cord. Often there is a tabetic degeneration of the posterior columns of the spinal cord. This condition is regarded at the present time as distinctive from the chronic inflammatory reaction of paresis. It is an associated condition and not an essential part of general paresis.

**Etiology.**—Syphilis is the cause of all cases of general paresis. Serologic and statistic researches during recent years show no disagreement in opinions as to this. The syphilis may be inherited or acquired. Among intelligent patients affected with general paresis a history of infection with syphilis can be obtained in 90 per cent. of instances (Hoche). Serologic examinations show the presence of syphilis in 100 per cent. of cases.

The fact that this disease shows its first symptoms at a relatively late period after infection and that it differs essentially from the late manifestations of syphilis, such as gummatous and tertiary lesions, has given to it the designation of a metasyphilitic process. The average interval between infection and the appearance of neuropsychiatric symptoms is from ten to fifteen years (Kraepelin). Not every case of syphilis becomes diseased with general paresis. Statistics show that about 4 per cent. of those infected with syphilis develop general paresis.

What influences predispose one who has been infected with syphilis to develop general paresis is not known. "That mental exertion is an important factor has not been proved" (Bleuler). There is some agreement in the literature that excessive use of alcohol may predispose to the occurrence of general paresis. A variety of factors have been described as occurring in relation with the outbreak of the disorder without any conclusive evidences as to their importance, *i. e.*, heat-stroke and injuries of various sorts. It is probable that in most instances it will be found that symptoms of the disorder are present antedating the supposed precipitating cause.

The disease is more frequent among men than women. The age of greatest frequency is between the thirty-fifth and forty-fifth years. Before the thirtieth year it is of rare occurrence. Exceptional cases have been described as occurring in the seventh decade (Kraepelin).

**Diagnosis.**—The factors on which the diagnosis of general paresis is based have been considered. The question of differential diagnosis is less difficult than in earlier years when there was not available the serologic and anatomic data that we now have. From neither mental symptoms nor from the neurologic symptoms alone can one with certainty establish the clinical diagnosis of general paresis. Taken together they may be sufficient for diagnosis. Only with the serologic findings taken in connection with the mental and neurologic are sufficient data available to make certain the diagnosis.

The character of the emotional reactions, the memory disturbances, the type of delusions, and defective judgment are symptoms of an organic disorder of the brain. The neurologic disturbances are further evidence of an organic process. No one organic symptom is specific for general paresis. Several are evidences of a syphilitic disturbance of the nervous system, *e. g.*, the pupillary abnormalities. The speech disturbances are highly suggestive of general paresis, but are not absolutely diagnostic. Similar failures in articulation occur in organic disease of non-syphilitic type and also in functional disorders due to disturbances of attention



or emotional situations. Even the handwriting is not absolutely diagnostic. Abnormalities of this may occur in tremors and ataxias from organic nervous disorder other than general paresis, and not infrequently the abnormalities may be due to functional disturbances or episodes of excitement.

The so-called "paralytic" attack is often confused with apoplectic attacks and the epileptiform is sometimes regarded as an epileptic disturbance. The rapid recovery from residual paralyses remaining after an attack is observed in neurosyphilis and especially in general paresis.

It is in the serologic abnormalities that one finds the greatest diagnostic help. If there exists a positive Wassermann reaction in the blood it means that the individual has syphilis. The only exceptions to this are in certain unusual conditions, such as malaria, frambesia, leprosy (Nonne). If the cerebrospinal fluid contains an increased number of cellular elements of the lymphocyte type this means that there is present in the individual a chronic inflammation of the meninges of the central nervous system that is usually syphilitic or tubercular. If the spinal fluid gives a positive Wassermann reaction this indicates that there is a syphilitic disorder of the central nervous system. This may be cerebrospinal syphilis, tabes, or general paresis.

If the spinal fluid gives a strong decolorization of the first tubes in the series of a gold sol reaction (Lange's test) it means that there is a pathologic process causing degeneration of the nerve-cells and fibers of the brain. It may be general paresis, tumor of the central nervous system, or multiple sclerosis, etc. Milder reactions in the first tubes of the series or decolorization in the middle range of the series may mean syphilis of the nervous system or some other chronic inflammatory disorder.

The distinctive differences in the abnormalities occurring in the cerebrospinal fluid of disorders of the nervous system caused by syphilis have been given by Nonne as follows:

I. General paresis or taboparesis:

1. Wassermann reaction on blood positive (almost in 100 per cent.). Spinal fluid pressure often increased.
2. Phase I (Nonne-Apelt) reaction for globulin positive in about 95 to 100 per cent.
3. Lymphocytosis, positive in almost 95 per cent.
4. Wassermann reaction on fluid positive in about 75 per cent. when using 0.2 c.c. of fluid. If larger quantities are used reaction positive in 100 per cent.

II. Tabes (uncomplicated with general paresis):

1. Wassermann reaction on blood positive in 60 to 70 per cent. Spinal fluid pressure frequently increased.
2. Phase I (Nonne-Apelt) positive in 90 to 95 per cent.
3. Lymphocytosis positive in about 90 per cent.
4. Wassermann reaction on fluid positive in 5 to 10 per cent. when using 0.2 c.c. Using larger amounts of fluid the reaction is positive in almost 100 per cent.

### III. Cerebrospinal syphilis (syphilis of the nervous system):

1. Wassermann reaction on blood-serum positive in about 80 to 90 per cent. Spinal fluid pressure often increased.
2. Phase I (Nonne-Apelt) reaction negative only in exceptional cases.
3. Lymphocytosis almost always positive.
4. Wassermann reaction on fluid positive in about 10 per cent. when using 0.2 c.c. of fluid. Using larger quantities of fluid gives almost always positive reactions.

The chief clinical disorders that may have to be considered in differential diagnosis are: Neurasthenia, manic-depressive insanity, dementia præcox, epilepsy, brain tumor, organic psychosis, syphilitic and non-syphilitic.

**Treatment.**—Prevention of infection with syphilis will prevent the development of general paresis.

If infection has occurred earnest treatment must be at once undertaken. The more successful is the early treatment of syphilis, the less liability is there for the development of general paresis. If the nervous system becomes involved, treatment may bring about cure, but the problem is more difficult than with constitutional syphilis. In every case of neurosyphilis a thorough course of antisyphilitic treatment should be carried out by a competent physician. The methods of treatment seem to be less important than the thoroughness with which it is carried on.

If general paresis has developed, at the present time, treatment gives no definite assurance of cure of the disease. While an occasional case is known in which the symptoms have disappeared and the individual is again able to take up work, these are most exceptional. In most cases of paresis institutional confinement will be necessary. This matter depends upon the conduct of the patient and the family facilities for furnishing adequate home care.

**Forensic Relations.**—The individual with general paresis frequently comes in relation with the law in respect to his capacity in civil matters or as a result of abnormal conduct. Incapacity for mental responsibility must be assumed to exist as soon as the existence of general paresis can be proved.

It is in relation with actions in civil affairs occurring before the disorder had been suspected that difficult forensic questions will arise. The euphoric mood and impaired judgment that occur among the earliest symptoms often lead to reckless spending, making foolish business plans, acquiring obligations that cannot be met, or contracting marriages that are improper. It is often difficult to prove at just what time the disease had its beginnings. Anatomic studies of the brain in general paresis and serologic observations indicate that the nervous system may be disordered long before mental symptoms become apparent. Even if gross mental abnormalities are not present at a date in question, it may be possible to show from the testimony of witnesses that the individual had been acting in ways not in harmony with his

usual character. If a continuity in the development of the symptoms can be shown with those that are later present and are certainly those of general paresis, it may well be assumed that the beginnings of the disorder covered the period of the act. It is sometimes possible to place the time of the beginning of the disorder from changes in the handwriting of the individual. This often shows among the earliest symptoms of the disorder.

The testimony of one who has general paresis in the capacity of witness or accuser must be open to question. The memory disorder that is so uniformly present, the tendency to intermix facts with imagination, and the pathologic emotional state makes their testimony as witnesses unreliable.

Rarely do those who have general paresis commit crimes involving serious physical consequences. Their criminal offenses lie largely in minor crimes or actions against decency. They not infrequently are accused of larceny, swindling, forgery, slander, disturbing the peace, or resisting arrest. Their pathologic moods and their diminished self-control often leads to acts of a sexual character, such as exhibitionism, sexual perversions, or sexual assaults on children. Their ideas of wealth and their euphoric mood lead to a dissipation of their resources and those of others.

Questions of responsibility will be difficult to decide in respect to actions committed during periods of remission of the symptoms of general paresis. If there are present during the remission evidences of organic disturbances of the central nervous system, such as changes of the pupil, serologic abnormalities or speech disturbances, one should conclude that the individual still has general paresis and is mentally irresponsible.

#### MENTAL DISORDERS WITH TABES DORSALIS (TABES PSYCHOSIS)

While tabes frequently complicates general paresis, it is also sometimes associated with psychotic disturbances that clinically are different in symptomatology and course from that disorder and lacks in the central nervous system its characteristic pathology.

Mild mental abnormalities are not uncommonly present in tabes. Tabetic patients sometimes show instability of moods, tendencies toward emotional depression and irritability, and slight impairment of memory.

Occasionally acute hallucinatory episodes occur in tabes. The consciousness during these times is not unclear and the orientation is undisturbed. The hallucinations are chiefly of auditory type, but may involve any of the sensory fields. Such conditions may last a few weeks or months and then suddenly pass away.

In some cases of tabes there develops a paranoid mental attitude that has a more or less prolonged course, but usually the delusions persist for a period and then clear up only to return again in episodic outbreaks. The delusions take the form of ideas of reference or of persecution. Occasionally the delusions seem based upon the sensory



disturbances incident to tabes. They explain their peculiar feelings as due to various influences not infrequently in absurd and grotesque ideas.

The diagnosis of the disorder is not difficult when one can eliminate general paresis by serologic and symptomatologic differences. One must also consider whether the disorder is not an alcoholic hallucinatory or delusional state with tabes or an interrelation with dementia præcox.

Possibilities of conflicts with the laws would seem to exist in tabes psychoses in relation with the acute hallucinatory episodes and with the paranoid delusional states. The very definitely pathologic state of mind present in both relationships would seem to be of a quality to relieve of responsibility.

#### ORGANIC CEREBRAL DISORDERS WITH MENTAL SYMPTOMS (CEREBRAL TUMOR; CEREBRAL ABSCESS; CEREBRAL HEMORRHAGE AND SOFTENING; MULTIPLE SCLEROSIS; HUNTINGTON'S CHOREA)

There is a small number of organic disorders of the central nervous system whose symptoms are largely neurologic, but yet are often accompanied by mental disturbances.

The forensic relations of these are relatively slight. When it can be definitely shown that mental symptoms of any kind have occurred during the course of an organic brain disorder one cannot be sure that these have left undisturbed those mental functions that are involved in memory and processes of reasoning.

The most frequent symptoms occurring in these disorders are transitory episodes of unclear consciousness, memory disturbances, slowness in thinking, and emotional instability. The terminal states of these are usually more or less severe intellectual deterioration. In most cases there is present an excessive irritability. This may lead to conflicts with the laws, especially assaults that may cause physical injuries.

In civil matters organic brain disorders may impair the capacity of the individual to make contracts or execute a valid will. The more important of these disorders, apart from the well-differentiated psychoses, of organic pathology, *i. e.*, senile insanity, general paresis, etc., are brain tumors, cerebral abscess, cerebral hemorrhage or softening, multiple sclerosis, and Huntington's chorea.

#### BRAIN TUMORS

Tumors within the cranial cavity may produce mental disturbances either in the form of transitory mental disturbances of consciousness, pathologic emotional reactions, states of dulness or confusion, and terminal deterioration.

#### CEREBRAL ABSCESS

In general, the symptoms of abscess involving the substance of the brain are those found in brain tumors.

## CEREBRAL HEMORRHAGES AND SOFTENING

Clinically these are usually in relation with an attack of so-called apoplexy or "a stroke." This is usually accompanied by a more or less deep disturbance of consciousness. In the milder degrees of this and when consciousness is clearing the patient is confused and his actions lack normal control and direction. Occasionally there occur following the stroke transitory states of excitement with seriously disordered conduct that may have harmful results. After the immediate effects of the attack pass off there usually persist paralytic disturbances and more or less mental impairment. The frequent association of cerebral hemorrhage and softening with arteriosclerosis often produces symptoms of diffuse brain disturbances in addition to the focal effects of the vascular lesion.

## MULTIPLE SCLEROSIS

Where multiple sclerosis involves the brain in any considerable area there are usually mental symptoms. There is generally a marked emotional instability and irritability that may occasionally lead to actions of forensic importance.

## HUNTINGTON'S CHOREA (CHRONIC PROGRESSIVE CHOREA)

This is a chronic type of chorea usually occurring in adult life that is associated with a general intellectual deterioration. This disorder has a familial occurrence, many members through several generations usually being affected. Its forensic relations lie largely in connection with problems of mental capacity for conducting business affairs or testamentary acts.

## SENILE DEMENTIA

In advanced age there occur varying degrees of mental impairment that must be considered as physiologic, as it is a more or less normal characteristic. This is manifested in a narrowing of the range of interests, failure of memory, and a gradual change in the emotional reactions. All of these factors have their influence upon conduct and behavior and make up those distinctive qualities that are designated as senile.

Between this physiologic impairment of mental health and what is designated as senile dementia there are such gradations that it is impossible to distinguish any distinct separating limits.

"Senile dementia neither anatomically nor clinically shows any marked distinction from the normal senile period and is but a maximum degree of these changes." This is the conclusion of Simchowicz as a result of a comprehensive anatomic and clinical study of this disorder and the changes incident to old age.

These mental changes are generally noticeable in the seventh decade, but may occur earlier, even in the sixth or fifth. Anatomically changes in the brain agreeing with those found in senile dementia have been described as early as the thirty-sixth year of life (*senium præcox*, Alzheimer's disease). In relation to forensic problems it must be clearly understood that the term "senile" does not designate a sharply defined

period of time, but is used to characterize certain special mental qualities.

Even the normal senile qualities have an influence on thought and actions that may have forensic importance. Whims and traits that may or may not have been justified by adequate causes, but yet have been restrained from reasonable regard for the rights of others and decency of conduct, may by the general physiologic involution changes lead to actions that are unjust to others. This may be a matter for consideration in determining the capacity for disposition of property in which the rights of others are jeopardized by dislikes that have long been present, but in advanced age assume a pathologic intensity or are not controlled by good judgment. There is, however, a clear concept of what constitutes the group of symptoms clinically designated as senile dementia.

**Symptoms.**—Among the earliest signs of senile dementia are changes in the finer emotional qualities. There develops an indifference in their relations to others and their own personal interests very largely determine their conduct. They become neglectful of their personal appearance. They are stubborn and insistent and often harsh in their judgments. They often show a certain silliness in thought and behavior that is characterized as "childish." Erotic tendencies have a prominent part in their interests and often lead to acts of indecency or sexual assaults. There is a progressing impairment of their capacity for intellectual work. It becomes increasingly difficult for them to understand complicated situations and new details and experiences are not easily learned. Attention is not easily concentrated because of their forgetfulness and lack of interest.

The memory early shows serious disorder. The defects lie largely in a diminished capacity for retention of new perceptions. They forget names and details soon after they are acquired. Often there is a tendency to invent experiences and fill in the gaps of their memory by narrations of actions that never took place. Their thought moves in old channels. New ideas have no interest for them.

Delusions are common symptoms. These usually take the form of ideas of reference or suspicions. They believe themselves to be objects of persecution. Commonly the delusions refer to various bodily ills that have no basis in fact and are often most absurd and phantastic.

Hallucinations both auditory and visual are frequent occurrences. Usually they are more active during the night-time. These frequently are of a delirious character. They are troubled by spirits and mysterious influences, commonly of a terrifying character.

A characteristic of the senile and especially the senile dement is the nocturnal restlessness and a tendency to doze during the day. Many patients show much restlessness when awake. They busy themselves with various affairs that seem to be purposeful in quality, but carried on in ways showing marked disorientation and disordered judgment.

While certain symptoms are common to the general course of senile dementia, such as the emotional changes and the impairment of memory



and judgment, there are differences in the intensity and prominence of these that distinguish several clinical types of the disorder. The most distinctive of these types is the presbyophrenia. In this the disturbance of memory stands out most conspicuously, but the thought processes for a long time are carried on in fairly orderly ways and the judgment is little impaired. The patient forgets what he sees or hears in a very short time. He is, however, able to keep up a free flow of thought that is intermixed with fabrications and accounts of unreal experiences. Orientation is seriously affected. Ultimately dulness and evidences of extreme deterioration become prominent features.

In another type the condition may be characterized by the prominence of evidences of a progressive deterioration with mild intermixtures of delusions and hallucinations. Such a type is designated "simple senile dementia."

There are types in which the course is colored largely by emotional depression with delusions of self-accusation or intense apprehensiveness. These not infrequently lead to acts of violence against others or attempts at suicide.

**Senile Delirium.**—This is a type in which there is much clouding of consciousness, usually with marked excitement and terrifying hallucinations. The intensity of the reactions in this type often leads to a rapidly fatal termination. It is not uncommon for seniles who show evidences of mental deterioration to develop acute delirious episodes when in special situations. These have been described as occurring after cataract operations or from being confined in darkened rooms or following physical trauma.

Senile dementia is accompanied by the physical and neurologic changes incident to advanced age. There are the usual senile changes of the skin, hair and teeth, and various nutritional abnormalities. The edge of the iris is often bordered by the "arcus senilis." The blood-vessels and heart are frequently disordered by arteriosclerotic disorders. The bones often have an increased fragility that may result in fracture from trivial causes.

As neurologic disturbances there occur attacks of an apoplectiform or epileptiform type. The former frequently leave residuals, paralyses, and disorders of aphasic or apraxic type. The extremities show a characteristic fine tremor that usually is early discernible in the hand-writing.

**Pathologic Anatomy.**—In severe cases of senile dementia the brain quite uniformly shows gross abnormalities. The dura mater often shows hemorrhages. The pia mater is thickened and lacks the normal transparency, especially along the blood-vessels. The weight of the brain on an average is reduced about 200 gm. (Forel). The convolutions show varying degrees of atrophy. The basal blood-vessels are frequently sclerotic.

Microscopically the brain in senile dementia shows certain changes that seem to be characteristic for senile brain atrophy. They are found not only in brains of those having senile dementia, but occasionally in

those who die in extreme age, but have shown no clinical evidences of deterioration. These changes consist in the presence of small plaques scattered throughout the cortex and often in the bordering areas of white substance. They vary in appearance according to their phase of development. They appear as small focal areas of necrosis with deposits of finely granular substances. In later stages they show as small homogeneous areas surrounded by large fibrous glia cells. These plaques are so characteristic for senile brain atrophy that at present one would not be justified in assuming that senile dementia had existed in a case in which they were absent in the brain. In cases showing plaques there is nearly always present a peculiar degeneration in the neurofibrils of the nerve-cells. These are thickened and massed into whorls and tangles presenting very characteristic pictures. Fatty degeneration is commonly present in the nerve-cells. Many cells entirely disappear in various processes of degeneration and are replaced by neuroglia cells and fibers.

**Diagnosis.**—The chief difficulties lie in the distinction between what must be considered as maximum degrees of normal mental changes incident to advanced age and a pathologic mental state. This question is a matter of degree and no arbitrary dividing limits can be placed. The most frequent disorder for differential diagnosis is cerebral arteriosclerosis. While senile dementia is often complicated by arteriosclerosis of the brain the pathologic process of the former is essentially different. In senile deterioration the mental changes are more diffuse and the spread of the process more uniform than in arteriosclerosis. Focal symptoms are more characteristic of arteriosclerosis. As a rule, senile dementia appears at a later age than arteriosclerosis. From general paresis the disease is differentiated by the serologic abnormalities. The presbyophrenic type presents a clinical picture often suggesting that of Korsakow's disease. Usually there is a history of alcoholism in Korsakow's disease and an accompanying polyneuritis.

**Treatment.**—The problem is largely one of custody. Many cases can be well cared for at home under proper supervision. The question of institutional care is one depending upon the conduct of the patient and the family situation. In most cases where there are matters of property to be considered legal guardianship will have to be provided.

**Forensic Relations.**—The senile qualities of mind often lead to disturbances of conduct that are of criminal character. Aschaffenburg has shown that the more severe crimes involving stealing and physical injury after the age of seventy are infrequent when compared with those of earlier age periods. But crimes involving acts of indecency and sexual offenses are comparatively frequent. The most common of these are sexual offenses with children. It has been noted by Bresler that with increasing age men have a greater tendency to contract marriage with women of youthful age. It has been found that only in a small percentage of instances have seniles accused of offenses ever been previously charged with crime, and where this has occurred the former crimes were not of a sexual character.

The cause of these is less a reawakening of increase of sex impulses than a lessening of inhibitions. This comes as a result of the impairment of judgment and the emotional dulling that is a general feature of the senile deterioration.

It is necessary in all cases where criminal actions are committed by seniles to examine with care the mental state of the individual in order to determine the question of responsibility. The problem for the psychiatric expert in cases showing more or less well-marked senile deterioration is to determine whether or not the degree of their mental impairment is such as to exclude the capacity of the individual to distinguish between the right and wrong of his actions in a particular situation or to resist an impulse to commit the act in question. In senile dementia the question is usually less one of impaired intelligence that would make reasoning impossible than it is of an inability to resist the tendency to commit an act that he may know to be wrong.

In civil relations the failure of memory, disordered judgment, and emotional deterioration present a situation that must seriously impair capacity for acting in reasonable ways and with due consideration for all that may be involved in an action involving property rights and justice to others. The degree of this in its influence upon normal capacity must be decided in each individual case.

### MENTAL DISORDERS WITH CEREBRAL ARTERIOSCLEROSIS

The sclerosis and degenerative changes occurring in blood-vessels of the brain lead to disturbances of the structures of the central nervous system that produces disorders of normal mental functioning.

The clinical form, in which the disease courses varies with the character and location of the vascular changes, and the personality of the individual. As a rule, symptoms of a physical or neurologic character occur before the mental symptoms have developed to a degree that one could speak of a psychosis. Very many cases of cerebral arteriosclerosis never come to the attention of a psychiatrist, the conditions being treated chiefly as a physical or neurologic disorder in which mental abnormalities are less important than other aspects of the case.

**Symptoms.**—In general, the symptoms are those of a progressive lessening of the mental capabilities, especially those involving memory. These mental abnormalities are accompanied by a variety of transitory and permanent neurologic disturbances, referable to diffuse and focal involvement of nervous structures from the effects of vascular lesions.

The onset is usually gradual. When the disorder seems from its gross manifestations to date from an apoplectiform attack it is usually possible to detect mental abnormalities long antedating the more acute outbreak. Individuals who are intellectual workers are often able to appreciate early in the disorder that their mind works less efficiently than formerly and that a greater effort than usual is needed to do their customary mental work. They fatigue more easily than formerly and are more irritable.



From the first there is an increasing forgetfulness. This is largely noticed in their incapacity to retain recent perceptions. As the disease progresses this becomes more marked, and when there are episodes of disordered consciousness either with or without association with apoplectiform attacks, there are often amnesias for varying periods of time. The sleep is commonly disturbed. During the day the patients may be drowsy and through the night wakeful. The moods show a variability characteristic for organic brain disorder. Changes from laughing to crying occur easily and without adequate cause. Their orientation is usually quite well preserved during the earlier periods of the disorder. Apart from disorientation explainable to attacks of unclear consciousness their inaccuracies are due to inattention and forgetfulness. Hallucinations are not uncommon. They may be either auditory or visual and are usually of an apprehensive quality. Comprehension is slowed and thinking becomes increasingly difficult. Delusions are not infrequent and usually take the form of ideas of reference or suspicion, or of fears of injury or disease.

There is usually a good degree of appreciation of illness throughout the course of the disease. Episodes of motor excitement are not infrequent; these have been known to lead to serious attempts at suicide. In advanced stages of the disorder the degree of mental impairment may be extreme. A feature of the course of arteriosclerotic deterioration is its uneven character. It seems to advance in steps or phases of exacerbation and in this way contrasts with the more even progress of senile deterioration.

Cerebral arteriosclerosis is regularly accompanied by neurologic abnormalities referable to structural changes in the brain consequent upon disordered blood-vessels. Among the most constant of these are headaches and attacks of dizziness. The headaches are usually described as feelings of pressure in the frontal or occipital regions. They bear a close relation to high blood-pressure and are made worse by actions causing cerebral hyperemia.

Most cases of cerebral arteriosclerosis have some time during their course attacks of an apoplectiform or epileptiform type. The recovery from these may be complete, but it is more usual for some disturbance of motility or sensibility permanently to persist. Various sensory disturbances, such as peculiar feelings in the skin or extremities, are common symptoms, often appearing early in the course of the disorder and are usually of transitory duration.

The speech is not infrequently disordered. This may occur as some form of aphasia or as a difficulty of articulation which sometimes closely resembles the speech disturbances of general paresis.

Cerebral arteriosclerosis is usually accompanied by vascular disturbances and their effects in the organ of the body. These chiefly involve the heart and kidneys. The blood-pressure is commonly increased, the radial systolic pressure ranging sometimes well over 200 mm.

**Pathologic Anatomy.**—In all cases of cerebral arteriosclerosis the blood-vessels of the central nervous system show pathologic changes

and in most instances there are various structural abnormalities in the nervous tissue of the brain.

These blood-vessel changes may show in the gross examination of the brain as arteriosclerotic degenerations in the large extracerebral trunks and meningeal vessels. Often there are recent or old hemorrhages in the meninges or brain substance. Various coarse defects in the brain are common. These are usually small or large destructions of brain substance from the effects of softenings or vascular occlusions. Apart from these defects the surface of the convolutions is frequently hummocky and uneven from fine tissue degenerations and subsequent gliosis. The arteriosclerotic process is usually uneven in its distribution; commonly changes are marked in certain regions, while others appear quite normal.

Microscopically, many blood-vessels show characteristic changes in their walls. These lead often to a narrowing of the channel of the vessel, sometimes to complete obliteration. Where there are gross defects there is more or less coarse loss of the nervous elements and reactive changes in the connective tissue and neuroglia. The finer arteriosclerotic changes show as multiple focal areas of loss of nerve elements and reactive neuroglia proliferation.

**Diagnosis.**—In many instances, especially when there are characteristic neurologic abnormalities, the diagnosis is not difficult. While arteriosclerotic changes in the blood-vessels of the body suggest a cerebral arteriosclerosis, this association is by no means constant. The chief disorders which will most frequently come up for differential consideration are general paresis and senile dementia.

Cerebral arteriosclerosis occurs most commonly between the ages of fifty-five and sixty-five, a period later than that of general paresis and earlier than senile dementia. Occasional cerebral arteriosclerosis is observed in earlier periods, even in the fifth decade or rarely in the fourth.

General paresis is differentiated by the pupillary abnormalities and the serologic reactions. The same data are of differential value in separating this disorder from cerebral syphilis. In senile dementia the personality as a whole is much more severely disordered than in arteriosclerosis. The symptoms of cerebral arteriosclerosis are more those of a combination of separate symptoms rather than the diffuse changes of senile dementia.

**Prognosis.**—The disorder may continue for many years after the first mental symptoms occur. There is no known cure for the defects resulting from the vascular changes. The prominence of symptoms may vary during the course, but, as a rule, the disorder is progressive. Death usually occurs from cardiorenal complications or from cerebral hemorrhage.

**Treatment.**—As a prophylactic measure one should avoid whatever is known to have a harmful influence on the vascular system. The best known of these are alcohol and tobacco. After the disorder has developed the individual should be kept free from severe mental and physical exertions. Emotional excitement should be prevented. Light

occupations and diversions are of value in keeping off depression and indifference. Physical complications, especially of the heart and kidneys, should receive competent medical care.

**Forensic Relations.**—In general, these are far less serious in criminal relations than are general paresis and senile dementia. Often a criminal act will be the first evidence of the change in the personality of the individual. The impairment of intellectual capacity in its relation to reasoning as to the nature and consequences of an action will depend upon the degree of the arteriosclerotic changes and their localization. Frequently there are severe neurologic disturbances without much that is mentally abnormal. This is often the case with hemorrhages into the internal capsule. Each individual case must be considered by itself. The capacity for civil responsibilities must be judged in the same relations as that of other organic brain disorders. It corresponds closely to that involved in senile dementia.

### MENTAL DISORDERS WITH EPILEPSY

To give a definition of epilepsy as a nervous and mental disorder is not easy. Conceptions as to what is to be included under the term have been greatly extended in recent years. While formerly the chief characteristic of the disorder was the epileptiform attack, one now knows that this is but one aspect of the disease. Besides the attack and its various modifications or equivalents one must also include a variety of transitory disturbances of consciousness and of the emotional reactions, and certain permanent abnormalities of the character or constitution.

In the consideration of epilepsy one must distinguish between idiopathic or essential epilepsy and symptomatic epilepsy.

Idiopathic epilepsy is a disorder that is characterized by the more or less frequent recurrence of epileptiform attacks or transitory disturbances of consciousness that cannot in our present knowledge be placed in the group of symptomatic epilepsy.

Symptomatic epilepsy includes those epileptic disorders in which the epileptiform attacks occur in relation with known structural changes involving the central nervous system or are due to toxic causes. Symptomatic epilepsy occurs in association with brain tumors, various forms of neurosyphilis, cerebral arteriosclerosis, multiple sclerosis, and senile insanity. They occur as a result of toxic factors such as alcohol, lead, uremia, and in eclampsia.

Attacks of an epileptiform character occur in relation with the psychoneuroses and dementia præcox. They are especially frequent in hysteria where they may present problems for differential diagnosis that are sometimes quite difficult. In this present consideration of epilepsy in its forensic relations we will be concerned chiefly with the idiopathic type of epilepsy.

**The Epileptiform Attack (Grand Mal).**—The most striking feature of epilepsy is the convulsive attack. This is characterized by the sudden onset of a convulsion of the entire body musculature and



by a loss of consciousness. The patient suddenly becomes rigid. The head is turned to one side or drawn backward. The jaws and lips are tightly closed. The eyes are fixed as if staring forward or are drawn to one side. The arms and legs are extended and the hands clenched. The abdominal walls are drawn inward and respiration seems to cease. At the beginning of the attack the patient utters a rather characteristic cry caused by the sudden forcing out of air by the contraction of the respiratory muscles. The face becomes congested and cyanotic. This tonic phase lasts for about ten to twenty seconds and passes suddenly into the clonic phase of the attack. The extremities and head are thrown into short violent jerking. The breathing is resumed in deep inspirations, and expirations sometimes giving hoarse gurgling sounds. The saliva runs from the mouth and is usually foamy from intermixture with air. It is not infrequently stained with blood that comes from biting the tongue or cheeks during the convulsion. Often the urine and bowel contents pass away during the convulsive movements. During the first period of the attack the pupils of the eyes are usually contracted. This is followed by marked widening and loss of all reaction to light. During the height of the attack the patient gives no reaction to external stimulation. The tendon reflexes are abolished and Babinski's sign is often present. These reflex disturbances sometimes persist for hours after the attack has passed off. The period of clonic movements lasts from one to twenty minutes.

Immediately after the convulsion the patient usually drops into a deep sleep that may continue for a few minutes to several hours. Less commonly the patient may clear up rapidly and after a brief period may return to his usual mental state.

Where attacks occur in rapid succession the condition is designated as status epilepticus.

Usually for some time after a convulsion the patient continues unclear and confused in his actions. Memory for the period of the attack is always defective. The degree of this depends upon the depth of the unconsciousness during the convulsion. As a rule, the amnesia is complete for the entire period.

**Aura.**—Often the attack is preceded by various subjective disturbances that give warning of the oncoming convulsion. These are called the aura. They may occur as a brief period of irritability or depression or as peculiar sensations in various parts of the body.

**Atypical Attacks (Equivalents, Petit Mal).**—The epileptiform attack varies much in respect to severity and the form in which the disturbance occurs. Instead of the motor convulsion there may occur brief attacks of unclear consciousness. In these the patient suddenly becomes pale, the eyes have a glassy appearance, and the lips or tongue make peculiar movements. These minor attacks in contradistinction to the severe attacks of grand mal type are designated as petit mal.

There are other attacks in which the patient may for a brief period appear as if changed and show various oddities of behavior. Atypical attacks either in the form of petit mal or as transitory episodes of

disordered consciousness are sometimes designated as epileptic equivalents.

**Jacksonian Attack.**—The convulsive movements of the epileptic attack are sometimes limited to a part of the body such as an extremity or the head or face. These are usually caused by direct irritation of the motor region of the cortex, by a tumor or some localized pathologic process. These are a feature of the symptomatic type of epilepsy rather than the idiopathic.

While many epileptics in the intervals between attacks are apparently normal in their mental life, the majority show various abnormalities of character or suffer from transitory disturbances of the consciousness or feelings. In contradistinction to those aspects of epilepsy that center in the convulsions and motor attacks, these conditions, in which the disturbances lie largely in the mental reactions of the individual are designated as "psychic epilepsy."

Many epileptics show permanent abnormalities of character that justify one in speaking of an epileptic temperament or constitution. The most marked feature of this is the excessive irritability of the epileptic. This may be more or less constantly present, but more generally occurs in episodic outbursts. These often lead to conflicts with the laws.

The epileptic during the progress of his disorder tends to develop a more or less marked impairment of his intellectual capacity and his emotional qualities. The thought processes become slowed. The range of their intellectual interests becomes more and more narrowed, and their thought becomes centered largely upon their own personal relations. They lose an appreciation of the relative values in their thinking and their conversation shows a characteristic circumstantiality and concern with needless details. They become indifferent to the rights of others and are often coarse and brutal in their conduct. Their memory is disordered both from amnesias related to their attacks of disordered consciousness and from a progressing lessening of retentive capacity. This leads to an uncertainty and inaccuracy of their memories of past experiences and makes their testimony as witnesses or accusers unreliable.

Epileptic deterioration varies much in degree of severity from the mildest mental impairment to profound dementia. One must distinguish from true epileptic deterioration the gross defects of intelligence that occur when epilepsy is associated with idiocy or feeble-mindedness. Such conditions are states of arrested mental development rather than deterioration and are due to structural defects in the central nervous system.

Most epileptics and especially those with mental deterioration react badly to alcohol. Alcohol tends to increase their irritability and to lead to disorders of conduct that often come in conflict with the laws. An epileptic who at times would be regarded as responsible may under the influence of alcohol acquire, even with small quantities, a mental state that is definitely pathologic.

The majority of serious actions of epileptics that are in conflict

with the laws occur in relation with acute transitory states of mental disorder. These occur as abnormal moods or feelings or as episodic states of unclear consciousness. The most frequent of the abnormal emotional states are periodic episodes of irritability and mild depression, the so-called epileptic ill humor. These may occur without any external cause and are usually of brief duration. They may precede a convulsion or appear as independent disturbances. During the episode the patient is irritable, quarrelsome, and fault finding. He is easily angered and may commit actions that bring harm to others or himself. In some instances the ill humor is accompanied by feelings of anxiety which leads to restlessness and desire to get away from what seems to irritate him. These often are in close relation with some of the impulsive actions of epileptics such as suddenly leaving the family, or business, making needless journeys, or acts of incendiarism. Memory for experiences during these episodes of irritability is not usually abnormal.

Instead of the ill humor the mood may be one of euphoria, or the patient may be mildly excited and commit minor criminal acts, such as swindling or making himself a nuisance.

Not infrequently the moods of ill humor lead the patient to secure relief from his tensions and uneasiness by taking alcohol. Many cases of dipsomania seem to arise in association with the abnormal moods of epileptics.

One of the most characteristic features of the course of epilepsy is the occurrence of transitory disturbances of consciousness. Apart from the disordered consciousness associated with the convulsive attack there occur a variety of episodes in which consciousness is more or less unclear. The petit mal attack represents one of the mildest forms in which this occurs. In this the patient is for a brief period in a state in which consciousness is not abolished, but for the time being is not in normal relations with the world about him.

The epileptic sometimes shows a more prolonged period of unclearness in which he may act or speak, but his self-consciousness is not in normal relations with events and situations of which he is a part. He behaves as if he were dazed or in a dream. Such abnormal states of consciousness have been designated as "dream states" or twilight states of consciousness (*dämmerzustände*). These disturbances usually come on suddenly. During these he may go about among others and apparently direct his movements correctly, even in quite complicated situations. He may make journeys, undertake business affairs, or carry through actions that have a definite plan. His outward appearance may give no indication of his disordered mental state. In other instances his attitude and behavior is uncertain and as if he were confused. Individuals in this state have sometimes been regarded as intoxicated.

While in a "twilight state" of consciousness epileptics may commit acts that have forensic importance. The more common of their crimes are larceny, arson, or damaging property. Not infrequently their actions are of sexual character, such as indecent exposure or open masturbation. Rarely are more serious crimes involving physical harm committed



during these periods, unless at the same time their mind is disordered by hallucinations or pathologic moods or feelings. Occasionally the patient may wander away from home or even undertake long journeys. These states of wandering have been variously classed as epileptic fugues or as poriomania. Usually the actions carried on during these periods have little relation with the normal or usual conduct of the individual. Occasionally questions difficult to decide as to responsibility will be presented where the actions carried out in unclear states had been in the thought of the individual during normal periods of consciousness. Epileptics have been known to steal, in periods of unclearness, objects for which they had expressed a desire, or commit actions that had been considered while the mind was normally clear.

These twilight states of consciousness in which systematized and complicated actions are carried out may last from a few minutes or hours to several days. The return to normal is abrupt or may come on after a deep sleep.

While occasionally a patient may show fragmentary or hazy memories for some of his experiences during these periods, there usually is a complete and sharply limited amnesia for all that occurred.

**Transitory Delirious States (Epileptic Delirium, Epileptic Furor).**—These differ from the twilight states of consciousness in the occurrence of a marked degree of confusion, vivid hallucinations, and an anxious or apprehensive emotional state. Usually during these episodes the patient is greatly excited and frequently commits acts of serious consequences, such as physical assaults or homicide. These delirious states may be closely associated with a convulsion or may occur as an equivalent for the motor attack. The convulsion may precede or follow the delirium. The hallucinations of the epileptic are usually quite characteristic in their terrifying or distressing content. In the visual field they see fires, bloody scenes, people being injured, etc. The voices that they hear are threatening or disagreeable. Quite frequently the hallucinations are of religious quality.

**Epileptic Stupor.**—Instead of excitement there sometimes occur periods of stupor. The patient appears dull and slow in action. His comprehension and thinking are slowed. In more severe forms the attitude is not unlike that seen in catatonic stupor with symptoms of negativism and refusal to speak or eat. The stupor may be interrupted by outbursts of excitement and uncontrolled conduct that occasionally has harmful results.

**Epileptic Paranoid States.**—Epileptics sometimes develop during the course of their disorder delusional states of a paranoid character. These usually occur as delusions of persecution and have been known to lead to actions harmful to others.

**Course.**—This varies greatly. In many cases the attacks continue with more or less regularity throughout life and there progresses the characteristic deterioration. In some cases the attacks increase in frequency as age progresses. In a few cases the attacks cease, but the constitutional changes continue.

**Prognosis.**—Where deterioration exists the prognosis is, of course, bad for recovery, although the progress of the mental impairment may be checked by proper care and treatment. In a small percentage of cases, especially those beginning after puberty, the attacks disappear spontaneously. A few cases seem to be definitely cured by medicinal and hygienic treatment.

**Diagnosis.**—The diagnosis is to be based upon the convulsive attacks, the transitory disturbances of consciousness, and the abnormalities of character. Convulsions of an epileptiform type occur so frequently as incidents in a variety of disorders of the nervous system or bodily functions that the occasional occurrence of an epileptiform attack is not sufficient to prove the existence of epilepsy as a disease. This is especially true of convulsions occurring in childhood or in late adult life.

In order to establish the diagnosis of epilepsy in the important relations that must exist in medicolegal problems it is necessary to prove that the attacks occur at more or less regular intervals and that there also exist characteristic abnormalities of constitution and temperament. These are a tendency toward pathologic emotional states, such as episodes of irritability or the occurrence of transitory disorders of consciousness.

The diagnosis of the motor attack may be difficult when the only information as to its occurrence is the statement of the patient or when they occur only at night. Nocturnal attacks often leave evidences of their occurrence in the condition of the bed in which the patient slept. In such instances it is common to find the bedclothes stained with blood from bites of the mouth or tongue or by stains from urine that was passed in the attack. The attitude of the patient in the morning may be such as to show that he had had a troubled night. As a rule, those who have had nocturnal attacks are more dull and complaining in the morning after an attack has occurred.

The description of an attack by an observer may not be sufficient to distinguish whether the attack was of epileptic or hysteric character. It is generally agreed that neither the type of movements present in the attack nor the condition of consciousness during that time can distinguish an epileptic attack from one occurring in hysteria. The depth of degree in which consciousness is disturbed in the attack is not a differentiating feature nor is the presence or absence of the pupillary reflexes.

Epilepsy and hysteria are often associated conditions. There are epileptics who at times have hysterical symptoms such as sensory disturbances or transitory disorders of consciousness, and in hysteria convulsions occur which cannot be distinguished from those of epileptic type. Such intermixtures are designated hystero-epilepsy.

The epileptic often shows physical abnormalities that may be of diagnostic help. When the epilepsy is in relation with gross development anomalies of the central nervous system the shape of the head and face are often abnormal. These may be hydrocephalic types of

head, microcephaly, or various asymmetries. The ears are frequently malformed. The bones of the cranium may show defects from injuries or surgical operations. The head and body often have scars from burns or injuries, and the tongue and inner surface bear the marks of biting during an attack. In the literature dealing with epilepsy one sometimes finds mention of the "epileptic physiognomy." While there is no absolutely distinctive type of features that is characteristic of epilepsy, it is true that epileptics show certain abnormalities of the head and face that indicate a degenerate type of physical formations. Among these features Kraepelin mentions a low and receding forehead with broad flat cranium, protruding supra-orbital ridges, massive development of the jaws, and thick lips. Many epileptics show a variety of neurologic abnormalities, especially of the eyes and face, and tremors or reflex disturbances in the extremities.

The memory disturbances are of much importance in the diagnosis of epilepsy. The amnesias that occur are of different degrees of completeness. Some epileptics immediately following an attack of disordered consciousness are able to give details of their actions and their motives, but when appearing in court at a later date may have forgotten all of this. There are others who can recall nothing after the attack, but later on can remember vaguely some details of their disturbed period. Occasionally memories of ideas that were formed in unclear states of consciousness are remembered when awake. This fact is of importance in judging as to the reliability of the testimony of epileptics. It has been observed that epileptics sometimes make false statements and accusations that are based on ideas derived from their periods of unclearness.

**Forensic Relations.**—From a medicolegal standpoint one who has epilepsy is not to be regarded as irresponsible solely because of the existence of epilepsy. He is, however, one who at any time may develop states of mind that definitely exclude capacity for responsibility. The question of responsibility must be judged solely in relation with the mental condition at the time of an act in question. When there exists a chronic state of mental deterioration then the epileptic must be judged by the standards applied to one who has any organic type of dementia. Each individual case is to be judged by itself as to the degree of the deterioration and its effect upon the capacity to remember and think clearly.

**Treatment.**—A detailed consideration of the treatment of epilepsy is hardly called for in dealing with the forensic aspects of the disorder. Few neurologic disorders are so largely individual in the technic of treatment as epilepsy. There is no known specific or causal treatment of the disorder. For many years much reliance has been placed upon various preparations of bromids to check the attacks; sometimes with much success, but often with no appreciable benefit. The continued use of bromid preparations often seems to produce an increase of the irritability of the patient and disturbances of digestion. The most generally used remedies are the potassium or sodium salts of bromin. These are



given in dosage just sufficient to control the attacks. The usual dosage is from 45 to 120 gr. per diem for adults and proportionally less for children. The salts should be given in at least a half-glassful of water. When the attacks are only nocturnal the dose should be given in the evening. When they occur through the day, it may be given before each meal. Within recent years much success has been obtained from the use of luminal (phenobarbital). The dosage given is 1 tablet ( $1\frac{1}{2}$  gr.) at bedtime; but if this is not sufficient to control attacks, it may be increased 1 tablet at a time until clinical effect is secured, although much discretion should be employed in advancing the dosage beyond 5 tablets daily—when more than one tablet is given daily a divided schedule is advisable. When attacks are under control dosage should be gradually decreased until a minimal controlling dosage is determined. Toxic features should be watched for, although these are not frequent. Women, as a rule, require higher dosage than men.

In all cases of epilepsy careful attention should be given to the diet and habits of the patient. Most cases of epilepsy do best on as closely restricted diet as is considerate with adequate nutrition. Heavy and rich foods should be avoided. Meat should be used very infrequently. Many patients do well on a milk diet. Constipation should be prevented by proper dietetic or medicinal regulation. Epileptics should avoid whatever tends to be emotionally exciting. They should lead a life as free as possible from excessive stresses. The possibilities of the occurrence of attacks at any time requires that their occupations should be regulated so as to avoid the danger of self-injuries and accidents. Above all, epileptics should use no alcohol. Most epileptics do not require institutional care. The needs of this are determined by the social situation of the patient, the degree of his deterioration, and the dangers to the safety of the community.

#### DEMENTIA PRÆCOX (SCHIZOPHRENIA)

“Dementia præcox is a mental disorder that follows essentially a chronic course, but presents varying phases. The progress of the disorder may stop at any stage, but a complete recovery is not likely to occur. It is characterized by a specific type of alteration in the thought and emotional reactions and in the relation that the individual assumes toward realities. In every case there is a more or less well-defined “splitting” of the psychic functions and the thought processes are controlled by groups of ideas (complexes) that have a strong emotional interest for the personality” (Bleuler).

**Symptoms.**—The mental abnormalities and disordered behavior that form the symptoms of dementia præcox vary in character and prominence according to the phase of the disorder. In most cases it is possible to distinguish a prodromal phase, an acute phase, and a chronic phase. The disorder progresses either to a more or less successful adjustment of the mental abnormalities or to mental deterioration.

While the disorder in most instances has a more or less abrupt onset, this period is usually preceded by a phase of indefinite mental

abnormalities that are not clearly distinguishable from traits and tendencies that had long been characteristic of the personality.

It is commonly found that long before the acute development of the characteristic symptoms of the disorder that the individual who develops dementia præcox was regarded as different from his associates. The serious significance of this for subsequent developments is rarely appreciated. These differences are shown in abnormal shyness, irritability, lack of frankness, various oddities of behavior, and an inclination to be too much occupied with mental phantasies. These characteristics often become accentuated during the period of puberty, when so frequently the acute onset of a definitely psychotic state occurs.

In many instances the beginnings of the acute phase are not associated with anything unusual in the patient's experience. In others it is more or less closely in relation with some physical disorder, such as an accident or a febrile disease, or with some mental experience of unusual emotional intensity, such as fright or some acute unpleasant situation.

Often it is impossible to differentiate any acute onset, the abnormalities being exaggerations of temperamental peculiarities or a gradual decline in emotional responsiveness and a progressing disorder of the intellectual capacity. When the disorder develops abruptly the symptoms may be those of depression or excitement or states of confusion and bewilderment. The patient is suddenly overwhelmed by a feeling of strangeness in his mental experiences. Thoughts pass through his mind that he cannot understand. His mind seems to be "all mixed up." Conflicting thoughts are presented. Good and bad oppose one another (ambivalence). He is bewildered and does not know which to follow. The normal flow of thought is broken by frequent pauses and blocking.

This disorder of the association of ideas forms one of the fundamental symptoms of the disease. Its effects are to break apart the normal course of associations and ideas and fragments of ideas, often quite unrelated, intermingle, and give a characteristic incoherency to the thought productions.

One of the most characteristic symptoms of the disease is the emotional disturbances that are always present when the disorder is at all pronounced. These vary from slight indifference and lessened emotional responsiveness to their experiences, to the most intense apathy. The effect of this is to impair their interest in their work or responsibilities. Intellectual development suffers because they take little or no interest in reading or in what may be mentally stimulating. In the more severe degrees the patient loses all interest in the care of his person and even for his necessary requirements.

In spite of this emotional dulness to their experiences and environment, there is usually present an irritability and a tendency to impulsive outbursts of anger that often makes it difficult to care for them and not infrequently may have a forensic importance.

In their moral qualities they show the same dulness as in other

emotional reactions. They rarely become confirmed criminals, but not uncommonly commit misdemeanors of stealing or swindling. When actions of aggressive physical type are committed these are usually of an impulsive quality and stand in close relation to delusions or hallucinations.

Another fundamental symptom of dementia præcox is the tendency to be troubled mentally by opposing forces (ambivalence). The ideas arising within their consciousness have positive and negative values. Ideas impelling them to act in one direction are opposed by others leading them in opposite ways. This shows in the course of their thought, which is often hesitating and blocked by conflicting emotions.

To the patient the strange mental experiences that he is having seem to be explainable by the idea that influences other than those centering in his own personality are controlling his mind. The thoughts that arise in his mind are not his own and his behavior and actions are not the expression of his own will.

They are only intelligible to him by recognizing that a fundamental change has taken place within himself. No longer is his personality a unit in relation with his mental functioning. His mind ceases to act with a unity of purpose directed in the interests of his personality. There has occurred a split in the integration of the personality, a change that gives to this disorder the characteristic descriptive designation of schizophrenia. He expresses his feelings and interpretations of his difficulties in more or less vague delusions. He is an object of persecution or his body is possessed by evil spirits. His thoughts are taken from him or his strength is being drawn out of his body. His bodily functions are disordered by strange disease processes. Poisons of various sorts in the air or in his food are making him ill.

The delusional elaboration is intimately directed by wishes or fears that have generally had their source in periods antedating the acute development of the symptoms. The patient accomplishes in his delusions what he has been unable to obtain in life or he escapes from situations that have been unsatisfactory to him. He may express these in ideas of changed identity. He is not what he is supposed to be and he has delusions as to his parentage. The delusions may be of an expansive type. He has acquired great wealth or power or he identifies himself as some great personage.

Religious delusions are often in the foreground. He has had some mysterious experience in which God has had some very special relation with him. He has been given a new birth or chosen for a special mission. Delusions may continue throughout the entire course of the disorder or may gradually fade away. As the emotional deterioration increases less interest is shown in the delusions. They commonly become absurd and persist only in a confused and incoherent mass of phantastic expressions. In the instances of marked improvement when the delusions cease to be expressed one rarely finds that the patient regards these as having been unreal experiences or corrects them in a normal way.

The feelings and thoughts of the dementia præcox patient tend to



control his attention at the expense of interest in what is going on about him. The character of these is such that they cannot be adjusted with realities. The conflicts that occur are so unpleasant that the patient withdraws from the realities of life and concerns himself only with his phantasies. He lives in an imaginative world. While real and imaginative exist, both are kept more or less distinctly apart. This symptom Bleuler has designated as "autism."

Hallucinations in some form occur in most cases of dementia præcox. Those of hearing are the most frequent. They come on during the early periods of the disorder and commonly continue through the entire duration. The patient experiences these as voices or strange noises. They may be indefinite and their source unknown or they are referred to as coming from some particular person. They may come from within the body or from the world outside or from supernatural sources. They may be pleasant or unpleasant. Usually when first experienced they are extremely annoying and the patient adopts various ways of dealing with them, such as stopping his ears or keeping away from certain places or persons. Hallucinations harmonize closely with the thought of the patient and are usually intimately intermingled with his delusions. Often they have a strong influence upon his conduct and are directly in relation with acts of aggression or violence against those he believes are the source of his annoyance. In the later phases of the disorder he becomes more or less indifferent to their occurrence.

The behavior and actions of the dementia præcox patient stand in intimate relation with the fundamental disturbances in the thought and feelings and are much influenced by hallucinations and delusions. There generally occurs a progressive lessening of his spontaneous initiative and an unsteadiness in his ability to keep at a task. As the disorder continues he tends to develop various abnormalities of attitude and conduct. According to varieties in the mental difficulties he may develop reactions of depression with or without anxiety. He may show stupor, with disinclination to care for himself or give any attention to his surroundings. Often this may be accompanied by negativism, showing in active resistances against the efforts of others to care for him. Some cases show excitement usually of an impulsive type. This may be present at the acute onset of the disorder and subside after a brief period or may occur as episodic outbreaks during the progress of the disease. These not infrequently are in relation with actions that are of forensic significance.

The speech of the dementia præcox patient in many cases shows characteristic abnormalities. These may be noticed in peculiarities of intonations and rhythm, odd ways of expression, such as lisping, stuttering, or affectations of various sorts. Words and sentences are used in peculiar relations or jumbled together in senseless combinations. The most common disturbance is the hesitation that occurs as a result of blocking of the thought processes.

The handwriting often harmonizes with the abnormalities of speech. The letters in their writing may be formed in peculiar ways or the words

may be written in a set formal type often intermingled with symbolic drawings.

Comprehension and orientation are rarely primarily disturbed. They are, however, much influenced by the abnormal emotional reactions and by the falsification of realities that develop during the course of the disease.

The memory is usually impaired for events following the development of the disease. The degree of this depends upon the amount of interest the patient shows. The memory for earlier experiences is well retained, but may be falsified in the delusional developments.

**Catatonic Symptoms.**—In many cases of dementia præcox there are certain abnormalities that outwardly show in peculiarities of attitude and behavior that have been designated as catatonic symptoms. Some of these are occasionally observed in other clinical types of mental disease, but in dementia præcox they are especially pronounced and characteristic. The body or extremities may be held in peculiar stiff positions, a condition that is called catalepsy. The movements and expressive actions may be carried out in set, formal ways that have been designated as stereotyped actions. There may be mannerisms or peculiar oddities in the way the patient acts or in positions he assumes. There occur outbursts of excitement in which the activities are impulsive and stereotyped. He may be abnormally influenced by suggestions or his actions carried out in automatic ways.

An important and frequent variety of catatonic symptoms are those reactions that are included under the term "negativism." The form in which this may occur varies much, but in general it shows either in opposing a proper carrying out of an action or in doing the opposite from what would be expected. It may occur in a refusal to talk or eat, or in various forms of resistance against what is done for them.

**Physical Symptoms.**—These vary much among the different clinical types and in different phases of the course of the disorder. The weight, as a rule, shows marked variations. Generally in the acute phases the weight falls and rises as the emotional dulness and characteristic deterioration comes on. The most striking physical abnormalities occur in relation with the functions controlled by the sympathetic nervous system. The more common of these is cyanosis of the extremities, changes in the pulse-rate, edema of the hands and feet, or excessive secretion of saliva. Menstruation is often disordered. Sleep is disturbed, especially in the acute stage.

**The Course of the Disease.**—This varies much among the different clinical types and among individuals even of the same type. In general, the course is that of a progressive emotional deterioration interrupted by acute exacerbations of the fundamental and accessory symptoms characteristic of dementia præcox.

The downward progress may be stopped at any phase, but there persists an impairment of the emotional life of the individual with more or less disordered thought processes and various oddities of expression and conduct. Many cases of dementia præcox improve to a

degree that makes it possible for them to live more or less adequately in the community. Usually, however, they need special supervision. A few cases seem to recover, but a careful examination of these will usually show slight residuals of the disease and the individual rarely reaches the level of efficiency that might have been expected had health continued. A considerable proportion of cases admitted to institutions deteriorate to such a degree that permanent custodial care is necessary.

In exceptional instances death occurs in acute phases directly from the effects of the disease. The majority live for many years. Causes of death that are indirectly related to the disorder are suicide, accidents, and tuberculosis.

**Clinical Types.**—The symptoms characteristic of dementia præcox may combine in various ways, and the course of the disorder show certain differences that distinguish several clinical types.

**Paranoid Type.**—The characteristics of this are the prominence that delusions and hallucinations have among the symptoms. The onset is usually gradual. Often the beginnings long antedate the time when the patient comes under observation. In many cases the symptoms may be such as not to produce serious social disabilities. In others the character of the delusions and their influence upon conduct is such as to require early restraint and institutional care. The delusions are chiefly those of reference or influence or of persecution. Not infrequently they are centered upon some imaginary physical disorder. Ultimately there develops a characteristic dementia præcox type of deterioration with residuals of the former delusions persisting more or less prominently. In some cases this end stage is reached after a few months; in others it may occur only after years.

**Catatonic Type (Catatonia).**—In this type catatonic symptoms are prominently in the foreground. The onset may be acute or the symptoms may develop gradually. The course is usually one of chronic dementia præcox deterioration with contrasting states of stupor and excitement. The prognosis in this type is better than in any of the others. Kraepelin finds that about 13 per cent. make an almost complete recovery.

**Hebephrenic Type.**—This includes those forms of dementia præcox in which there is lack of prominence of catatonic symptoms and the delusional elaboration is less extensive and more loosely constructed than in the paranoid type. Hallucinations, especially auditory, are almost always present. The onset is usually characterized by confusion and bewilderment, often with mild restlessness and excitement, or by symptoms of depression. The acute beginning is followed by a chronic phase in which there is an increasing emotional deterioration and the persistence of a disordered stream of thought. Various oddities of behavior usually occur.

**Heboidophrenia (Dementia Simplex).**—In this type the characteristic feature is a progressing emotional deterioration with oddities of behavior and lack of prominence of hallucinations and delusions. The disease begins insidiously and develops slowly. It leads to a marked



lack of interest of the patient in his environment and in his life responsibilities. In his behavior he has difficulty in adjusting himself to home and family life or is unable to continue at steady employment. This often leads to wandering and vagabondage, and a considerable number of this group are commonly found among the dependent classes.

**Diagnosis.**—In the usual form of the disease this is not difficult. The individual symptoms taken by themselves are often uncertain in their diagnostic relations, but taken together in relation with the previous history of the individual and the progress of the course of the disease they present a very characteristic clinical picture.

The most frequent differential problems of diagnosis will occur in relation with manic-depressive insanity. Phases and symptoms of each often present similarities. The differentiation sometimes can only be made as the specific schizophrenic symptoms become prominent.

The early symptoms of dementia præcox not uncommonly are quite like the reactions and episodic disturbances of the psychoneuroses, especially those occurring in hysteria. The differentiation can be made by the presence or absence of definite delusions, and in the character of the hallucinations and by the subsequent course of the disorder.

Transitory schizophrenic reactions may occur in psychopathic personalities that are often impossible in themselves to differentiate from those of dementia præcox.

The deterioration of dementia præcox may have to be distinguished from the mental enfeeblement of congenital feeble-mindedness. The distinctions here would lie in the previous history.

**Causes.**—Of all the various factors that come into association with the development of dementia præcox at the present time, we know of no one that can be regarded as of specific causal importance.

Hereditary abnormalities occur in the families of dementia præcox with greater frequency than among those who are normal. It is commonly observed that those who develop dementia præcox usually show in their early youth peculiarities of their personality. These are chiefly tendencies toward seclusiveness, lack of frankness, and inclination to withdraw from realities and interest themselves in mental phantasies. The disorder develops with special frequency in the period of puberty and adolescence. Two-thirds of the cases of dementia præcox develop between the fifteenth and thirtieth years. Cases have been known to occur as early as the tenth year and as late as the age of sixty.

Masturbation and sexual experiences are frequently associated with the development of the disorder, but there is no certain evidence as to their direct causal importance.

The weight of opinion at the present time is that the etiologic factors are to be found primarily in the mental life of the individual. The emotional interests of the individual during his development gain a pathologic degree of importance for his personality that makes it impossible to adjust these in an adequate way to the demands of his life.

**Pathologic Anatomy.**—In many cases of dementia præcox pathologic changes are present among the nerve-cells of the cortex.

They are usually present in deaths occurring directly from the disease in acute phases.

In old cases abnormalities among the nerve-cells and neuroglia are commonly found. But their direct relation to the disease is uncertain.

**Treatment.**—This entirely depends upon the phase of the disorder. In the acute phase, when the reactions are socially disturbing, the patient should be cared for in mental hospitals. As the acute symptoms subside the treatment should be directed toward arousing or sustaining the flagging emotional interests. This can be best accomplished by occupational therapy and regulated employment.

Much can be accomplished along these lines in life outside of an institution. The chief matter is to regulate the occupation and life to the mental capabilities of the patient, increasing the complexity of this as the improvement allows.

**Forensic Relations.**—The fundamental disturbances that are active in the production of dementia præcox seriously impair the capacity of the individual having this disorder from adapting himself to the complexities of ordinary social life. The uniform and severe disturbance of the emotional life leads either to an indifference that makes him heedless of legal regulations or his control by delusions and hallucinations brings about impulsive actions that may be harmful to others. For these reasons it may be expected that among those accused of crime there might be a considerable number of cases of dementia præcox.

As an individual type the case of dementia præcox is not prone to commit criminal acts. When they occur they are usually direct effects from incidental situations and transitory abnormalities during the course of the disorder. Those actions that require any considerable degree of energy and strength of will and decision are far less frequent than those growing out of indolence and weakness of will.

Crimes of a more serious type are uncommon. When they occur they are the results of sudden impulses often arising from hallucinations or directly in relation with delusions. They are actions usually brought against those they believe are annoying them.

A considerable proportion of the crimes committed by those having dementia præcox are the result of affective disturbances that are associated with alcoholism.

Suicide and self-mutilation are occasionally observed, especially in the catatonic type of the disease.

The majority of the crimes committed by the individual with dementia præcox are in the class of misdemeanors, such as disorderly conduct, disturbing the peace, resisting the enforcement of the laws, vagabondage, prostitution, and minor larcenies.

Acts against property are not frequent. They usually amount to petty stealing, appropriating articles that are more or less useless. Their thieving distinctly shows a weakness of will and aimlessness of purpose. Forgery and swindling are occasionally observed. Crimes requiring complicated planning and deliberation are infrequent.

The emotional deterioration and the irritations of orderly social and

family life often lead to wandering and vagabondage and ultimately drifting into the class of those who are supported as dependents in almshouses.

All cases of dementia præcox are clearly to be regarded as having mental disease to a degree that disqualifies them for legal responsibility for their actions.

The question of responsibility may often be difficult to determine in those cases in which mental abnormalities have in large part passed into the background, and where residual defects can only be demonstrated by examinations more extensive and carefully made than is usual in the ordinary procedures of the courts in dealing with criminals. It may also be difficult to judge as to responsibility in those who before the onset of definite evidences of dementia præcox have been known to commit acts of crime or delinquencies. Often in these cases careful observation will disclose the existence of symptoms of dementia præcox long antedating the abrupt outbreak.

A case illustrative of this given by Hoche is that of a young man nineteen years of age who had been previously in good physical health. He had shown various traits of psychopathic quality that had not attracted much attention. In school he was somewhat backward, but had acquired a fair amount of knowledge. One evening while walking with his bride, without any apparent reason, he killed her in a peculiarly cruel way. He at once gave himself up to the police. It was then established that some weeks before the act he had shown some excitement and had been troubled by vivid dreams. Immediately after the act he developed a childish, foolish behavior, and showed a marked indifference toward his parents. His character had undergone a complete change. Later on in prison he became seclusive and developed oddities of speech and behavior. He had religious hallucinations. At times he was stuporous and again excited. On one occasion he had a general convulsion.

### MANIC-DEPRESSIVE INSANITY

The term "manic-depressive insanity" was proposed by Kraepelin in 1899 to distinguish a group of mental disorders that includes, "on the one hand, the entire group of the so-called periodic and circular insanity, and, on the other, the simple manic excitement and the larger part of the clinical disorders commonly classed as melancholia and a not inconsiderable number of cases of amentia. In this group are to be placed certain mild affective disturbances sometimes coursing in periodic attacks or as more or less continuous states of pathologic emotions."

According to this conception, now quite generally accepted, manic-depressive insanity is to be considered as a constitutional tendency toward the occurrence of more or less sharply isolated attacks of mental disturbances. These attacks occur as phases of the disorder in which the symptoms may be dominantly those of excitement (manic phase) or of emotional depression (depressive phase) or of intermixtures of the fundamental symptoms of excitement and depression in the same attack (mixed phase).



## THE MANIC PHASE

**Symptoms.**—The dominant symptoms in the typical manic attack are: (1) emotional exhilaration, (2) flight of ideas, (3) decreased inhibitions to the motor impulses.

The degree with which these various symptoms are manifested varies much in individual cases. The milder forms are commonly designated as hypomania, the most extreme as manic frenzy. The emotional state is one of elation. Depending upon the degree of disturbance this varies between happy good humor to boisterous and unrestrained exuberance. There is more or less irascibility and instability of feelings that easily leads to outbursts of anger or rage when they are opposed or come in conflict with restraints in the environment. Not infrequently there occur brief episodes of crying or dejection that contrasts greatly with the usually elevated mood. The attention is distractible, easily shifting from one stimulus to another. This may be directed by sounds or objects in the environment or from some association arising in the course of thinking. Comprehension is, as a rule, clear, but when there is much distractibility, so that a sustained interest in an experience is impossible, a correct understanding may be impaired.

In the severe forms of manic excitement consciousness is not uncommonly more or less clouded. At these times hallucinations and delusions may be present, giving to the clinical picture the characteristics of a delirium. In the mild attacks orientation is undisturbed, although it may be more or less influenced by a playful distortion of the realities of a situation growing out of the euphoric mood. In the severe forms where consciousness is unclear disorientation is not uncommon.

The stream of thought is intimately influenced by the distractibility of attention, and the lessening of inhibitions gives acceleration to the speed with which the ideas arise. The manic individual is unusually talkative. Ideas flow rapidly, changing from one topic to another as new thoughts are determined by the shifting attention and emotional interests. This disorder of thought is designated flight of ideas. In severe degrees of excitement, especially where there is an accompanying unclearness of consciousness, the thought may be more or less incoherent and the connection between ideas unintelligible.

The content of the thought is largely determined by the emotional exhilaration. They talk of all sorts of things that interest them for the moment. The source of these may be discernible in influences coming from the environment or may come from personal interests that have always been more or less prominent in the imaginative life of the individual. Often the unreal quality of their productions seems to resemble delusions. This is, however, rarely held for any length of time or elaborated to the extent of being true delusions. In other instances there are definite delusions. These are usually of an expansive type and take the form of ideas of power or wealth, or are fanciful distortions of the realities of their surroundings.

Hallucinations are not often observed except in the more severe forms of excitement where consciousness is unclear. Often flighty re-

marks and fanciful interests may suggest perceptive disorders, but they are rarely so clearly differentiated as to be regarded as definite hallucinations.

The memory for the experiences of the manic attack is not lost, but is apt to be falsely colored by the dominant emotional exhilaration. Those who have previously had manic attacks rarely recall these in their true relations. Their euphoric mood during the period and their freedom from unpleasant inhibitions leaves no appreciation of having been ill. If the excitement has been severe and the consciousness unclear or absent, memory for the experiences of this time remains.

Action and behavior are always disordered in manic excitement, and it is in these relations that forensic problems usually arise. Fundamentally there is a lessening of the normal inhibitions to motor impulses. This leads to the overactivity that is so characteristic of this phase of the disorder. The euphoric mood and flighty thought with the increased ease of action leads to oddities of behavior. He acts with an unusual energy and seems to be continually busy. He concerns himself with many needless matters. He takes a conspicuous part in public activities and becomes bold and forward in social relations. He makes speeches, writes numerous letters, or busies himself with fanciful schemes and inventions. He spends his money recklessly, making extravagant purchases and complicating himself in business affairs. He becomes overactive in sexual relations, often contracting unsuitable marriages or showing various acts of indecency. Opposition to his activities often brings conflicts of more or less serious consequences to himself or others. From more mild manifestations of his activities to uncontrolled and frenzied excitement there are all degrees of transitions. It is a characteristic of manic activities that their beginnings seem to be directed by a definite purpose. This may change frequently as their attention is distracted, but usually it is possible to detect the source or aim from which it is initiated. Only in the most severe excitements is this apt to be absent. It is a quality that distinguishes manic actions from the unmotivated and stereotyped actions often occurring in dementia præcox.

The course of the manic attack varies much. While sometimes the excitement begins without prodromals, it is more often preceded by a brief phase of apprehensiveness or depression. Not uncommonly it develops in association with some experiences of strong emotional emphasis.

The height of the attack is, as a rule, reached within a few days or weeks, and then continues for some time, with variations in the intensity of the different symptoms. Recovery is sometimes sudden, but usually the convalescence is gradual. Ultimately in most instances recovery from the attack is complete. In a considerable number of cases the excitement is at once followed by a period of depression.

**Diagnosis.**—Excitement of the manic type is to be differentiated from excited episodes and phases that are incidents in the course of a variety of mental disorders of both organic and functional pathology.

Its most important diagnostic features are: (1) The purposeful character of the actions. (2) The association of the excitement with an elevated mood. (3) The distractibility of thought and flight of ideas. (4) The usual existence of a clear consciousness during the excitement and the lack of prominence of hallucinations. (5) The history of previous attacks of excitement or depression. In most instances differential diagnosis will not be difficult. Sometimes the distinctions can only be made from a prolonged observation and familiarity with the history and course of the disorder of which the excitement is a part. General paresis often shows excited phases that closely resemble those of the manic type. The excitement of general paresis should usually be easy to establish by the neurologic and serologic findings. In not a few instances it seems as if there were a coincidental occurrence of manic-depressive episodes in the course of general paresis. Excitement is a common occurrence during the course of dementia præcox, especially in the catatonic type. Here the distinction lies largely in the history and course of the disorder and certain differences in the characteristics of the excitement. The catatonic excitement is more impulsive than the manic or is stereotyped and limited in its range. Usually it lacks the purposeful aim that is so characteristic of the manic actions. The excitement of epilepsy usually lacks the characteristics of the manic type and is commonly in association with an unclear consciousness. Episodes of excitement are frequent in hysteria and in those of psychopathic constitution. In both of these disorders the excitement usually has its origin in affective influences and is rarely of long duration.

**Forensic Relations.**—Manic excitement has a seriously disturbing influence upon normal conduct and sometimes leads to situations and actions that are in conflict with the laws. As a rule criminal actions of a violent character and that cause serious injury to others seldom occur in manic excitement. The greater number of offenses lie in the group of disorderly conduct or swindling. They are sometimes charged with creating disturbances in public places, making false accusations or slanderous statements, swindling or contracting purchases without money to pay for them, dissipating personal resources or those of others, neglect of their families, offenses in relation with marriage contracts, sexual assaults, and minor physical injuries usually upon those who try to restrain them in their abnormal actions. Possibilities of criminal actions become increased when the manic individual is under the influence of alcohol. This brings an increased irritability and disturbances of consciousness that may lead to actions most serious in their effects. Capacity to reason correctly as to the right or wrong of an action and its consequences is severely impaired in manic excitement. The degree of impairment must vary with the intensity of the disturbance. The dominant euphoric mood that is characteristic of the disorder must have a serious influence upon the capacity of an individual to appreciate in their correct relations the emotional elements involved in a situation. Serious aspects are not considered and the normal inhibitions determined by these are not apt to be present.



It is largely in relation with the question of irresistible impulse that forensic relations of manic actions will have to be considered. There is in this disorder a pathologic lessening of normal inhibitions and the ease with which impulses may lead to actions impairs deliberation and the use of normal checks to motor impulses.

#### THE DEPRESSIVE PHASE

**Symptoms.**—The fundamental symptoms are: (1) emotional depression, (2) inhibition of the thought processes, (3) inhibition of motor impulses.

The prominence with which these occur varies much in individual cases. Between mild depression, differing but little from that occurring among individuals who would ordinarily not be regarded as seriously disordered, to deepest stupor or extreme agitation there are many transitions. The dominant emotional tone is one of sadness. This may vary between feelings of mild unhappiness to states of deepest dejection and hopelessness. Consciousness in most instances is clear. When the depth of depression is extreme, and more or less agitation is present, understanding of their surroundings and experiences may be impaired.

In the typical form of the depression of manic-depressive insanity the stream of thought is slowed. Spontaneous conversation is limited and there is a marked reduction in mental productivity. If there are delusions and there is much agitation retardation may be less conspicuous.

Few cases of depression are free from delusions. The content of these harmonizes with the depressed mood. There is commonly present a feeling of inadequacy and inferiority that is expressed in ideas of unworthiness and self-accusations. Trivial instances of misconduct in their past life become pathologically distorted into matters of great seriousness or their delusions may develop with no relation to realities. These may take the form of delusions of persecution or impoverishment. Commonly they are centered upon some imagined disorder of the body or its organs. The result of this is to lead the patient to take insufficient nourishment. In other instances their refusal of food comes from the belief that they are unworthy; that they have no money to pay for the food; that if they eat others will suffer.

Hallucinations as a rule are not important occurrences in depression. In the milder forms they are rarely present. In the more severe cases, especially those with agitation and delusions, they may be more or less conspicuous. They usually take the form of voices, accusing the patient of various misdeeds or threatening him with punishment. In some instances the delusions may be so prominent as to give the disorder a paranoid character.

The memory in general is not seriously impaired. When consciousness has been unclear it may be more or less faulty. It is common to find the memories of past experiences distorted and colored by the sadness of mood, so that the recollection of events and situations differs much from what actually occurred.

Motor impulses are inhibited. This leads to inactivity and marked slowness in movement and actions. Unusual efforts are necessary to accomplish their ordinary tasks. The patients become indolent, lie in bed when they should be up, or sit about unable to force themselves to work. Their speech is given in low tones and their handwriting is done in small feeble characters, and their output is greatly limited. When the retardation is extreme the condition is usually designated as depressive stupor.

**Diagnosis.**—The differential diagnosis of the depressed phase of manic-depressive insanity should not be difficult when the symptoms occur in their typical form and combinations. Often difficulties occur in differentiating states of depression with marked complaints of physical disturbances from conditions of neurasthenia and hypochondria. Not infrequently the distinctions are impossible to make. Many cases of neurasthenia show periodic recurrence and many mild cases of depression show somatic complaints. The more clear are the evidences of true retardation, the more certain can one be of the manic-depressive character of the disorder. Where there is a marked delusional development differentiation from some forms of paranoid types of dementia præcox may be difficult. The history of periodic recurrences and the absence of schizophrenic symptoms should be helpful in making distinctions.

Differentiation from depressions of psychogenic origin is not always possible. The history of manic-depressive disorders in the family and the occurrence of previous attacks of depression or excitement would indicate that the depression was of the manic-depressive type.

Distinctions between melancholia and depression of the 'manic-depressive type are often matters of individual viewpoint. For a few years following the development of Kraepelin's conception of the manic-depressive insanity the term "melancholia" was reserved for a type of intense depression accompanied by anxiety and agitation occurring in the late years of adult life or presenile period. Observation of cases of this type has shown that the majority of these belong in the group of manic-depressive insanity. The term "melancholia" as distinguishing a special group of psychoses, has ceased to appear in psychiatric text-books of recent years.

**Prognosis.**—In both manic and depressive phases the outcome of the single attack is good. Other attacks may be expected to occur, either of depression or manic excitement. In the intervals between attacks the individual may show no abnormality of mind or, at the most, an increased self-consciousness and sensitiveness.

**Forensic Relations.**—In the depressive phase of manic-depressive insanity these lie largely in actions directed against the individual himself. The most common of these are self-mutilations and attempts at suicide. The mutilations are usually the outcome of feeling the need of self-punishment or in reaction to hallucinations. It must be accepted as a general proposition that every case of depression of this type is liable to commit suicide. While not every suicide can be regarded as

an incident in a psychosis, the majority are the result of states of abnormal depression. The mental state that leads to suicide must be judged in each individual instance as it relates to responsibility for the act. If the motive for the suicide develops out of a delusional conception of realities it would seem that the capacity for responsibility were absent. It is necessary in order to prove that the suicidal act was committed in an irresponsible mental state that there be shown evidence of a diseased state of mind apart from that of the act itself.

It occasionally happens that the attempt at suicide brings harm to others. In efforts at suicide by self-destruction in the burning of a home others may lose their lives. Or food that has been poisoned for self-destruction may be eaten by others. Children and members of the family may be murdered from feelings of poverty or hopelessness or in reaction to auditory hallucinations.

Hoche (*Handbuch der Gerichtliche Psychiatrie*, p. 574) cites the case of a woman who while in a state of depression murdered her child and attempted suicide. She was twenty-four years of age and came from a family in which the father had committed suicide and the mother and one sister had suffered from attacks of mental disorder. She herself had been backward in learning and was temperamentally inclined toward gloomy thoughts. While pregnant she was much troubled by the thought she would be unable to nourish the child and that she could no longer go out for work by the day. After her confinement she complained of headaches and could not sleep. She then had an attack of influenza which greatly reduced her strength, and her headache and insomnia became worse. She was obsessed by the idea that she would starve and that the child would be the cause of this. Following a night in which she did not sleep and had suffered severely from headaches the thought came to her that she must throw herself in the well. She went out with this purpose and then strangled her child. After this action her face was pale and distorted and her whole body was in tremor. She did not deny having killed the child, but was unable to give any details as to how she had done this. The only reason she gave was that as she had no nourishment for the child it would be better that it should die. The woman to whom she had complained the night before of headache and her inability to nourish her child found her, after the deed, collapsed on the floor. She shed no tears, but said, "here will I sit until I die." She was placed in a psychiatric hospital, where for some time there continued symptoms of severe melancholia. Her mood was depressed and the content of her thought was sad. There was inhibition of thought, marked anxiety, and severe insomnia in spite of the use of hypnotics. She took little nourishment and her weight was decreased. After five months' residence in the hospital she was discharged recovered.

It has sometimes occurred that compulsive ideas occurring in depression may lead to stealing.

Case W. P. (S. P. H., 1963), a man aged thirty-two years was arrested for stealing cattle and because of attempts at suicide was sent to the Psychiatric Clinic at Ann Arbor for observation. The history showed in the family several instances of insanity. His grandfather had committed suicide. He was successful at his farm work and showed no serious abnormalities until the age of twenty-nine, when he complained of pain in the right abdomen. This was diagnosed as appendicitis. Operation was advised, but he refused this and lay in bed for several weeks. From then on his mood and behavior showed changes. He was easily discouraged. At times he was irritable and provoked trouble with his wife. In June, 1916 he stole several head of cattle that he saw in a field past which he was driving. He had no need of money, but as he saw them "something urged me to get them." After he had sold the cattle he appreciated that he had done wrong and wished to make restitution, but did not know how to do this. His family settled the affair and no legal proceedings were undertaken. He continued to be irritable, complained much of his lack of success in his work, and worried much over his physical health.



He thought that strange occurrences were going on about his farm; that someone had taken his tools and stolen the oats. In October of 1916 he again stole some cattle. He drove them stealthily to a neighboring town, made arrangements under an assumed name for their railroad shipment and sale. The check for the cattle was sent to a bank in a town in which he was not known. When he attempted to get the money he could not be identified. He told the company to whom he had sold the cattle that as they were unknown to the bankers their check had been refused payment. He then received the cash from the company. On his return home he was regretful for what he had done and knowing that it would be but a brief time before he would be arrested made plans for suicide. He purchased strychnin and decided to make way with himself as soon as the fall farm work was finished. He was soon arrested and while in jail managed to obtain a razor and cut his throat. He nearly died from loss of blood. After convalescence he was sent to Ann Arbor for observation. There his attitude was one of depression. He talked but little and what he said was given slowly in low tones. He gave a clear account of the actions that had led to his arrest and said that he had stolen the cattle because "someone urged him to do this one thing." Voices had told him that "they will take everything and ruin the family," at another time they said that he would be accused of murdering a man in Oklahoma. He showed much fear that he might be taken south to answer for this crime.

There were no physical or neurologic abnormalities. He later was transferred to a district hospital. There for several months he was depressed. Hallucinations were no longer present. He gradually improved, and seven months after his attempt at suicide he left the hospital as recovered.

The diagnosis in this case was depressed phase of manic-depressive insanity with hallucinations and paranoid ideas.

While in many criminal actions committed in states of depression a motive for their behavior may be evident, in others the actions have their source in the anxiety accompanying the depression. Often in this relation the intensity of the affect is so great as to produce more or less unclearness of consciousness. This prevents deliberation and the actions have the quality of abnormal impulses.

When there exists feelings of inferiority and delusions of self-accusations the depressed individual may be led to make false statements or accuse himself of criminal actions for which he has no responsibility.

Such a case is cited by Cramer (*Gerichtliche Psychiatrie*, p. 131). A murder had been committed for which the guilty party could not be found. About two weeks later a young man came to the police authorities and stated that he had committed the murder. His conduct when placed in jail suggested the existence of mental disorder and he was sent to a hospital. There he showed symptoms of melancholia with marked anxiety. Later on the real murderer was apprehended. The patient then began to improve and in time he made a good recovery. He explained his strange conduct as the result of anxiety and the feeling that he had that nothing was too bad for him, and by this he had been driven to accuse himself of the murder.

#### MIXED PHASES OF MANIC-DEPRESSIVE INSANITY

These occur as clinical pictures in which the fundamental symptoms of the manic and depressive phase may be intermingled in the same attack. Such conditions often present difficult problems for differential diagnosis, especially from some aspects of dementia præcox. A patient may have manic overactivity combined with the sadness of mood of the depressed phase. The exhilarated mood of the manic phase may be accompanied by retardation. Kraepelin describes eight different combinations of symptoms of the two groups producing as many different clinical types.

## CONSTITUTIONAL ABNORMALITIES OF MANIC-DEPRESSIVE TYPE

There are types of personality that show traits and tendencies in their moods and ways of acting that are distinctly of manic-depressive quality. Instead of being limited only to the period of the attacks the abnormalities are permanent qualities of temperament.

In this group belong those who are continually depressed in their emotional tone. They may be described as suffering from a constitutional depression. They have little joy in their experiences of life, are always gloomy, and have a strong feeling of inadequacy for the tasks that come to them. Contrasting with this type are those who are of manic temperament. Their mood is dominantly one of a continuous euphoria. They are optimistic in temperament, genial and light-hearted in their reactions. They show a chronic mild overactivity. They are always busy, full of schemes, and are regarded as flighty, fickle types of personalities.

There are others who show throughout their lives constitutional tendencies to more or less regular variations between mild euphoria and depression, and are classed as cyclothymic types of personality. The degree of the emotional disorder is far less than is characteristic of the definite manic or depressed attack.

## PHYSICAL AND NEUROLOGIC SYMPTOMS

The physical health in manic-depressive insanity is intimately related to the emotional state of the patient. In the manic excitement the appetite is usually good and except in severe attacks the weight keeps up or even increases a little. In depression the course of the weight corresponds closely to the progress of the attack. During its height the weight falls and begins to rise as convalescence occurs.

In both the manic and depressed phases sleep is generally impaired. In the depressed phases the insomnia is one of the most troublesome symptoms. There are no constant abnormalities in other bodily functions. Not infrequently there are complications from arteriosclerotic disorders, especially in cases occurring in the later years of life. Menstruation is often absent during the height of the attack. There are no important neurologic symptoms.

## COURSE

The first attack usually occurs between the fifteenth and thirtieth years. Not infrequently attacks occur in early childhood years. The attacks tend to recur during the life course of the individual. The successive attacks may all be of the same character or attacks of excitement may alternate more or less regularly with those of depression (circular insanity), or the attacks may be of irregular distribution, one or the other occurring in greater frequency.

The duration of the separate attacks, according to Kraepelin, varies much. There are attacks that may last only eight to fourteen days. Rarely there are instances of attacks lasting not more than a few hours. The average duration of a single attack is from six to eight months.

There are exceptional instances in which the attack continues from ten to eighteen years. The duration of the first attack, as a rule, does not exceed a few months.

#### PROGNOSIS

It is the rule that recovery occurs from the individual attack. The disorder is not progressive and never leads to a mental deterioration comparable with that occurring in psychoses of organic pathology or with that in epilepsy or dementia præcox. In intervals between attacks there may be no abnormalities, or at the most there may develop a slight sensitiveness and moodiness that is to be differentiated clearly from that present in the attack.

Experience shows that there is great probability of the recurrence of attacks. When the attack occurs as a reaction to some experience of strong emotional emphasis and there is no marked prominence of abnormalities in the constitution of the individual, there is least danger of recurrence. In those cases in which there are marked abnormalities of mental constitution and the attacks have occurred without relation to external factors, there is greater liability of the attacks recurring. Death may occur during the attack from complicating physical disorders or exhaustion. The commonest cause of death in the depressed phase is suicide.

#### ETIOLOGY

The cause of the disorder is not known. It is now believed that the underlying influences that determine the development of the disorders lie in abnormalities of the constitution of the individual. This is supported by the fact of the great frequency of occurrence of mental disorder in the family and antecedents of those having manic-depressive insanity. These occur in about 80 per cent. of all cases. Very commonly the disorder of the ancestors is some form of manic-depressive insanity.

#### PATHOLOGIC ANATOMY

There have been no constant structural alterations found in the body or nervous system of those who die either in the active phases of the disorder or in free intervals. It is not uncommon to find arteriosclerotic changes in the body or nervous system, but these are in no known specific relation to the disorder.

In some instances where death occurs during extreme excitement the nerve-cells of the cortex have shown pathologic changes in their form and staining qualities, but alterations of the same type have been found in disorders other than manic-depressive insanity.

Those who die in states of depression, especially of the agitated type, frequently show abnormalities among the nerve-cells of the cortex, but their relation to the pathology of the disorder is not known and they are by no means of constant occurrence.

#### TREATMENT

**Prophylactic.**—Those who come from families in which manic-depressive insanity occurs among its members are more liable to the



development of this disorder than those from families in which the disease is absent. This should be considered in the question of suitability for marriage.

Those who are unmarried and who have had an attack of manic-depressive insanity should not marry. There is no sure way to prevent the development of an attack. Occupation and situations involving unusual emotional stress should be avoided by those who have had an attack.

The methods of treatment to be followed after the attack has developed depends upon the character of the attack, its intensity, and the environmental relations of the individual. As a rule adequate treatment can only be carried out if the patient is in a sanitarium or hospital.

**Treatment of the Manic Attack.**—The patient, during the height of the excitement, should be placed in an environment as free from irritations as possible. The best methods for quieting the excitement are the use of the prolonged warm bath and the moist pack. If medicinal agents are to be used, they should be those that are least harmful to the health of the patient. The two most generally used sedatives are the bromids and hyosein hydrobromid.

**Treatment of the Depressed Phase.**—Every possible precaution should be taken to prevent self-injury. No depressed patient can be regarded as free from dangers of suicide. The lack of interest of the patient in eating makes it necessary to provide sufficient nourishment. This should be done by regular feedings of nutritious and easily digested foods. Often mechanical feeding will be required. Physical strength can be conserved by rest in bed, baths, and massage. If it is possible for the patient to be up, regular and systematic exercises should be provided. To combat the insomnia warm baths and medicinal agents may be employed. The most useful hypnotics are veronal or medinal, paraldehyd, or sulphonal. The agitation occurring in depressions, especially of the advanced years of life, can usually be controlled by careful use of preparations of opium.

#### PARANOIA (PARANOID CONDITIONS)

The conception of what mental disorders are to be classed as paranoia has changed much during the progress of psychiatry. In earlier periods the term "paranoia" distinguished a loosely constituted group of mental disorders in which the characteristic feature was the prominence of delusions. The disturbance of the mental functioning lay more largely in the field of intelligence and reasoning than in that of the feelings. As psychiatric experience increased it became evident that not all disorders in which delusions were conspicuous had similar etiologic relationships, nor did they follow the same course or have a like outcome. The largest number of these have come to be included in the group of dementia præcox, while others have found a place among psychoses due to toxic agents or organic disorders of the brain, or were transitory symptoms occurring in a variety of etiologic relationships. To these disorders in which delusions are prominent, but which do not follow the course of

the true paranoia, the adjective paranoid or paranoiac has been applied. Thus there are paranoid forms of dementia præcox, paranoid forms of alcoholic psychoses, etc. There also exist psychotic disturbances in which delusions are prominent features, where the clinical picture is difficult to define, and at the present time many of these are loosely grouped together under the designation of "paranoid states" or "paranoiac conditions."

The term "paranoid" is also commonly used to designate certain reaction tendencies among individuals who easily form suspicions or who develop lines of thought that border on the delusional, but never quite lead to definitely fixed beliefs. One thus speaks of paranoid reactions and paranoid individuals without any implication of the existence of a psychosis.

The conception of paranoia that is now generally held has been developed from the work of Kraepelin, who restricts the term "paranoia" to mental disorders that are characterized by a gradual development of a permanent and unassailable system of delusions with complete preservation of clarity of thought and orderly direction of the will and actions. With this conception paranoia instead of being one of the most frequent forms of mental disorders becomes one of the rarest, and now represents not more than 1 per cent. of the admissions to hospitals for mental disorders.

The essential feature of paranoia is the system of delusions. The term "system" implies a group of delusional beliefs built up around a central idea and all more or less logically interrelated. The source of the delusions is in the feelings or emotional life. Those who develop paranoia usually have abnormal relations among the feelings that tend to develop a pathologic type of personality. The fundamental factor in these relationships seems to be a dissatisfaction of the individual with his situation in life and difficulty in normally adapting himself to the conditions under which he lives. With this attitude those emotional qualities that stand close to the development of the personality become intensified. The paranoiac temperament is one that is characterized by suspicions, vanity, pride and fear, and a strongly developed egotism. These qualities may be noticeable years before the development of any marked delusions. Never do the delusions burst forth in their complete development. They are the result of gradual evolution often extending over years, during which time the abnormalities of the feelings have been shaping lines of thought that would explain in an acceptable way the personal relationship of the patient to the world and those with whom he comes in contact. The earliest evidences of these may be seen in protests against the attitude of the family and friends. He feels that he is pushed aside and not fairly treated. He entertains ideas of suspicions against them and sees in their actions and those of others references to himself. There gradually develops a hostility toward the family and associates that leads easily to the formation of delusions of persecution. He keeps apart from others, becomes seclusive, and shows various oddities of behavior. Out of this feeling of resentment there

grows a wish for relief, a desire for something big and satisfying. There comes to him the thought that he is of some special importance; that he has been born to something great; that he has a special mission. In support of this he develops lines of thought that will explain his imagined relationships. In this way there develops the system of delusions. The particular form that the delusions assume is influenced much by the intelligence and personal interests. It may be a delusion of being some religious character, or some important historic personage, or of being a great inventor, a person of wealth or power, or having unusual talents.

Their delusions greatly influence their behavior, and it is in this respect that the paranoiac so frequently comes into situations that have a forensic importance. In many instances erotic fancies enter into the delusional content. These sometimes lead to their making advances toward those involved in their delusions or to getting into situations that provoke scandal. They may have the belief that they are to be married or that hostile influences are separating them from the object of their admiration.

Hallucinations and illusions sometimes occur. They are, however, usually episodic symptoms and rarely form any important part of the disorder. They are usually in close harmony with their delusions and personal interests. Often the delusions are based upon actual experiences. These are usually distorted and wrongly interpreted to suit the interests of the patient. Actual conversations are given wrong meanings, or events and situations are interpreted in harmony with their wishes or fears. Not only are current experiences falsified, but they rework memories of past time in ways to support their delusions.

The delusions of the paranoiac are held with great firmness and resist all efforts toward their correction. Whatever is not in agreement with their beliefs is opposed with vigor and, on the other hand, the most trivial matters are believed with great credulity.

The moods and feelings harmonize closely with the delusions. In the earlier phases they react to their situation with depression and uneasiness. As the delusions of persecution take shape there is an increasing irritability and bitterness against those annoying them. In the expansive phase when the delusions are more stable the moods are largely those of a euphoric quality with feelings of egotism and self-satisfaction.

It is in relation with the behavior and actions of the paranoiac that forensic problems usually arise. In spite of the length of time during which delusions are developing there may be no marked change in the behavior until late in the disease. In other instances oddities of attitude and peculiar conduct are early features and mark the individual as one who is queer and eccentric. As the ideas of reference and delusions of persecution become more annoying they become restless and try to get away from their irritations. This may lead to traveling from place to place or frequent changes of employment. They protest against their situation and annoyances in letters or in the public press. They seek relief from their persecutors by appeals to the courts and public officials



and often enter into extensive litigations (litigious paranoia). It is in their efforts at self-help that injuries to others usually arise. They may make personal attacks against those whom they believe are responsible for their difficulties. Often the person attacked has no knowledge that he is involved in any relations with the aggressor.

Not uncommonly the expansive delusions lead to conflicts with the laws. The paranoiac attempts to live the part he has in his delusional beliefs and may force himself into places where he has no right and interfere with the peace and comfort of others.

On the other hand, many paranoiacs live their lives as harmless individuals well known in their communities as eccentric characters or cranks. This is particularly so with those who hold religious delusions. They sometimes wander about as pilgrims, clothed in phantastic garments, allow their hair to grow long, and copy the attitude of holy men.

As their delusions and behavior bring new complications additional material is added to their beliefs. When their mental disorder leads to hospital confinement, the friends, officials, and physicians who have had a part in this become involved in their delusions.

**Course.**—As a rule, the progress of the disorder is slow. The delusions may take years to reach their full development. Commonly they remain unchanged for a long period. The thought and understanding in matters apart from their delusions may be quite normal, and many paranoiacs are capable of carrying on more or less successfully their business or professional work.

While there is a lack of the mental deterioration that characterizes delusional states, such as the paranoid forms of dementia præcox or those due to toxic causes, it can be found in most cases of paranoia that the mental functioning as a whole is not free from impairment. Their absorption in their delusions leads to neglect of responsibilities and to perverted and illogic ways of thinking. This often leads to incorrect conclusions on matters even apart from their delusions.

**Causes.**—Nothing that is tangible is known as a specific cause. The main factor that stands out in most instances is that the paranoiac is one who has abnormalities of mental constitution that prevent his personality developing in normal ways. These have their beginnings in the earliest life of the individual and lead to what Kraepelin designates a "psychic malformation." Hereditary occurrence of mental abnormalities among the antecedents is frequent. The age of usual development of the prominent symptoms is between the thirty-fifth and forty-fifth years. Occasionally cases develop at later periods.

**Diagnosis.**—The circumstance that the patient may realize that his beliefs are regarded as delusional often leads him to attempt to conceal them and may make the problem of diagnosis difficult. When the beliefs deal with matters abstract or highly technical there may be difficulty in deciding as to their pathologic quality. This is sometimes the case with those in whom the beliefs relate to religious or philosophic subjects or to new inventions.

The distinctive features on which the diagnosis is to be based are

those embodied in the definition of paranoia, viz., the slow development of a logical system of delusions with the preservation of a logical and orderly process of thought in matters apart from the delusions. There is no tendency to marked mental deterioration. Their behavior, while often abnormal, can be readily understood when measured by their delusions. The personality as a whole may undergo transformation, but there is an entire absence of that disintegration characteristic of the delusional states occurring in dementia præcox.

While it is of little value to subdivide paranoias into various types depending upon the content of the delusions, there are two varieties of the disorder that are of such importance in medicolegal relations as to warrant special consideration. These are: (1) querulous or litigious paranoia and (2) paranoia with hypochondriac delusions.

**Querulous Paranoia.**—In certain types of paranoia the delusions center around a feeling of need of finding relief for their difficulties by resorting to courts and processes involving litigation.

Often the beginnings of this type date from some actual legal experience in which they have been a party. Instead of being satisfied by the outcome of the process, they enter with great energy into other litigations to secure what they believe to be their just rights. They are unable to profit by experience or to take a reasonable attitude. Efforts at disproof are unavailing and they see in these only additional evidences of the hostility that is being shown them. Judges and lawyers who have had a part in the legal proceedings become involved in the delusions. On the other hand, they are extremely credulous of most trivial matters that may support their own position.

The querulous paranoiac always has a marked emotional excitability toward matters touching his personal affairs, but in other relations his feeling reactions show little that is abnormal. The energy that they throw into the litigations is usually out of all proportion to the importance of the matters involved.

In the course of time there usually develops a mild degree of mental impairment. Their emotional excitability lessens. Their thinking and the formulation of matters that formerly intensely held their interest becomes less clear. They, however, never correct their delusional ideas.

**Diagnosis.**—This is not always easy. A litigious or querulous attitude is not essentially evidence of a psychosis. There are many individuals who cannot be regarded as insane who seem to have delight in attacking public wrongs or are energetic in bringing to the attention of courts and public officials what they regard as injustice. This attitude differs from that of the querulous paranoiac in the lack of true delusional ideas, regarding the matters in which they are interested, although they may be strongly biased in their beliefs. In the paranoiac the development of their beliefs centers around a single experience that is always kept in the foreground and interwoven with new experiences.

A querulous attitude is not uncommon in other psychoses, especially in general paresis and in manic excitement. The former of these disorders would show the characteristic serologic findings and the organic

features of paresis, and the latter would be accompanied by a flight of ideas and overactivity and other manic qualities.

There are certain types of psychopathic personalities that have a chronic irritability and ready tendency to get into quarrels with their associates and others (pseudoquerulants). They take an active interest in legal relations and attempt to secure legal redress for those in whom they take an interest or punishment for those they believe are in the wrong. Kraepelin speaks of these as assuming the position of "defenders of injustice." What distinguishes these from the querulous paranoiac is the absence of delusions and the ever-changing matters that take up their interests as contrasted with the one idea that forms the center of the delusions of the paranoiac.

The diagnosis may be difficult from the fact that sometimes it is true that the individual is not getting justice. Unfortunately, sometimes decisions and attitudes of courts and officials are not in accord with facts nor the honest interests of the litigants. Such naturally provoke hostility and bitterness that may readily take on a pathologic development.

The cause for the development of the querulous paranoia may lie in constitutional abnormalities of the patient. Kraepelin comments on the high frequency with which chronic alcoholism occurs in the antecedents. The disorder, as a rule, begins between the thirty-fifth and forty-fifth years of life, but sometimes may occur at a later period. The legal difficulties that so frequently occur at the beginning of the disorder are to be regarded as precipitating rather than as direct causes of the disorder. It has often been found that preceding the development of the disorder the patient may have been involved in legal processes without showing any psychotic qualities.

The outcome of the querulous type of paranoia is generally unfavorable. There ultimately occurs a more or less impairment of mental capability and the delusions always persist. In rare instances the patient may be able to adjust himself fairly successfully outside of institutional supervision.

**Paranoia With Hypochondriac Ideas.**—There are types of paranoia that center around the idea of physical illness. These have been designated by Hoche as chronic hypochondriac paranoia. Hypochondriac ideas are a part of many abnormal mental states. They occur in the psychoneuroses, in neurasthenia, dementia præcox, manic depressive insanity, general paresis, and senile dementia. But there are sometimes observed cases in which the ideas of physical illness are of definite delusional quality and are elaborated in a systematic way resembling the development of the paranoiac attitude. Such conditions sometimes lead to disorders of behavior that may have serious consequences for others. Hoche cites the case of a woman who for a long time held ideas of attempts being made to poison her. These at one time brought about her commitment to a hospital. She was subsequently released. While in the hospital she developed the idea that she had been visited by a man by whom she had become pregnant. To verify this she consulted a physician. As a result of the examination she developed



the idea that the physician had injured her internal organs and as an act of revenge she decided to kill him. She purchased a revolver for this purpose and shot at him, with no serious results. The question of a mental state that excluded capacity for responsibility was not difficult to decide in this particular case, but where the ideas have some likelihood of having been possible the matter of decision may be difficult.

**Treatment.**—There is nothing to be suggested as a curative measure. The majority of the patients can find it possible to live their lives outside of hospital care. Where acute situations develop or where they come in conflict with the law they require custodial care, but except where there is a possibility of harmful actions they should again be released. Confinement only aggravates the bitterness against those involved in their delusions.

In dealing with the querulous types of paranoia efforts should be directed toward keeping the patient as far as possible away from irritating influences. This can be accomplished by changes of environment and personal contacts. It is often an advantage to place them for a brief time in a hospital when their conduct is disturbing the comfort of others or when acute situations develop. Continued custodial care is not beneficial. Usually after a brief residence in a hospital they reach a condition that will enable them to do fairly well in the community.

**Forensic Relations.**—The chronic forms of paranoia commonly present problems having medicolegal importance. This is largely because the character of the delusions easily leads to conflicts with the law and the offenses are often of a serious type.

The problem for the expert is to decide from the symptoms whether or not a psychosis is present. This involves proof of the existence of delusions, and their incorrigibility. It should be possible to show that these center about a specific matter, around which is developed an increasing delusional system. The question of mental responsibility of the querulous individual is a matter difficult to decide. It is unreasonable to believe that everyone who enters with excessive energy into impractical litigation is irresponsible. There are great individual differences in this regard. Nor can the question be decided by the importance of the matters at issue.

To exclude definitely normal capacity for responsibility it must be shown that the querulous individual has a content of thought that is delusional; that his querulous attitude was not a lifelong characteristic, but had undergone progressive development.

#### CONSTITUTIONAL PSYCHOPATHIC INFERIORITY (PSYCHOPATHIC PERSONALITIES)

There are many individuals whose mental constitution and ways of reacting to their experiences characterize them as differing from those who are normal, but yet not insane. Their abnormalities lie largely in the quality and intensity of their emotional reactions and in the effects these have on their behavior. Between this group and the normal there are all degrees of transitions, but the pathologic symptoms always

predominate over the normal. On the other hand, there are often inter-mixtures with various mental disorders, especially hysteria and paranoid states. Not uncommonly the abnormality of personality forms the basis on which is developed one of the well-differentiated psychoses, such as dementia præcox, manic-depressive insanity, or paranoia. These conditions have been given various designations in the literature, such as degenerates, constitutional psychopathic inferiority, and psychopathic personalities. The latter term has come into quite general use and has been used by Kraepelin in a very comprehensive study of the group as a whole.

Kraepelin describes several different types among the group as a whole, that for convenience of description can be distinguished by the grouping and prominence of various symptoms. The more important of these are: (a) The excitable; (b) the inadequate; (c) the impulsive; (d) the eccentric; (e) the pathologic liars and swindlers; (f) the anti-social, and (g) the quarrelsome.

(a) **The Excitable.**—"These are individuals who from slight external causes develop more or less severe excitement that may be dangerous to themselves or others. After the passing off of the excitement observation shows the existence of constitutional psychopathic traits and the psychopathic character of the excitement" (Kraepelin).

Their special characteristic is the strong emotional excitability. They are easily thrown into anger; they have an extreme sensitiveness toward their environment and react with frequent changes of mood. When not excited they commonly show mild depression. Others may be companionable and even industrious and efficient. Some are self-conscious, coarse, and unbearable.

The duration of the excitement is brief and usually over within a few hours. Often during the excitement the consciousness is unclear. They later describe their mind as having been confused; they felt as if they had been in a dream.

Many show hysteric symptoms, such as visions, sensibility disorders, attacks of fainting, or loss of speech during the excitement.

The fundamental factors in this group are the unstable emotional background, the defective self-control, the strong outbursts of feeling that rapidly pass off, and a peculiar childish undeveloped personality. As might be expected the excitable psychopath easily gets into conflict with the laws. Attempts at suicide are of great frequency. These often occur under the influence of alcohol. Sex delinquencies are frequent. They are not uncommonly charged with making criminal threats, disturbing the peace, or of making physical assaults and sometimes murder.

The prognosis in general is rather favorable. The nature of their attacks tends to keep them more or less in confinement and therefore they are less frequent as age advances.

**Treatment.**—Exciting influences should be avoided. This may necessitate their removal from the family. The acute outbursts of excitement may be best treated by rest in bed or a prolonged warm bath. Occasionally a small dose of sedative, such as hyoscin, may be needed.

(b) **The Inadequate Personality.**—The group includes those psychopaths who are of unstable character and weak in volitional self-control.

Their interests are superficial. Their mood is usually light hearted and they have a marked self-esteem. Their own will and wishes are for them of first importance. Their most severe disorder is the lack of strength of will. From early childhood they are notable for their soft, forceless ways and inability to stand on their own feet. They are unable to carry through any lasting work and their plans change frequently. They often become involved in sexual difficulties and their inability to resist attractions often leads to their becoming involved in debts.

Their most frequent crimes are stealing and deception, begging, or prostitution. Rarely do they commit serious physical assaults. Suicide is very frequent.

The prognosis for this group is serious. Their weak will gives little possibility of constructive help.

(c) **The Impulsive Personality.**—The characteristic of this type is the impulsive quality to their actions. Decisions are made by the driving force of feelings rather than by deliberation. Their actions thus are uncontrolled by reason or plan.

According to the directions in which their impulses extend, it is possible to distinguish these special clinical types, viz.: (1) Spendthrifts, (2) wanderers or tramps, (3) dipsomaniacs.

The spendthrifts are characterized by their tendency toward immoderate spending. This leads to acquiring debts and with this come social complications.

The wanderers include individuals who from early childhood have an overpowering desire to wander away. Often when they come back they are remorseful, but when the impulse comes again they are unable to resist. This trait is most frequently observed among the youthful.

The dipsomaniac includes those who have an impulsive tendency to alcoholism. At intervals they are abstinent or drink only moderately. The attack usually develops out of a depressed mood. Generally they show other psychopathic traits such as unsteadiness, lack of dependibility, and defective judgment.

(d) **The Eccentric Individual.**—This group includes individuals who show striking oddities of thought and behavior that are not the result of the effects of a psychosis. Their judgments are apt to be one-sided; their conduct appears to be without aim and not always intelligible. They lack an appreciation of realities and fail to take into account actual relationships. They are unstable and incapable of sticking to any line of work. Most of them are unable to live normally in domestic relations and develop an antagonism because of their inability to live peacefully with others on account of their eccentricities. They rarely present problems of a criminal character.

(e) **Pathologic Liars and Swindlers.**—The characteristics of this group correspond with those described by Delbrück as Pseudologia



Phantastica. Its special symptoms are the extraordinary liveliness of the imagination and a tendency to be led away by this. Accompanying this is an unsteadiness in their aims and purposes. Their imagination may know no bounds and their inventions are made with no concern for facts or realities.

As a rule their productions are of expansive quality. They tell of great adventures and experiences of which they are the central figure. The content of these is often shaped by current events or by matters that have been of public interest. They assume titles to which they have no right and in childish ways try to live a part consistent with their phantasies. They tell stories to awaken sympathy and secure personal gain. A considerable number of this group get into the ranks of the criminal class.

Intermingled with their lying are acts of deception and swindling. The most common form of this is running up accounts without any ability to pay. Not infrequently they follow a particular class of swindling, such as imposing on physicians and hospitals.

Many of these individuals show hysteric features. The most frequent of these are states of excitement following some irritating experience. In these the consciousness may be clouded and their reactions show the Ganser symptom. This group is not clearly marked off from the normal. The distinction is that while lying and deception are quite normally practised, it is usually done to accomplish some personal wish. When the lying goes beyond this it becomes pathologic. The distinctions from insane delusional states lie largely in the fact that their imaginations as a rule are not definitely believed. They are not true delusions.

(f) **The Antisocial Personality.**—Kraepelin places in this group those who have psychopathic traits and tendencies that make it difficult for them to conform to the customs of the social organization in which they live.

The quality that is most characteristic of those in this group is a lack of all deep emotional responsiveness. They are uninfluenced by the joy or grief of their neighborhood. They lack all impulse toward working for the common good. They have an opposition to regular work. They are untruthful and lie not only to get out of personal difficulties, but even to harm others. Their judgments are formed quickly and are not fairly balanced. They lack pity and sympathy and even in their childhood years they show unusual cruelty. Many of the children who are truants from school and home will later develop personalities of the antisocial type. Their behavior commonly brings them into conflict with the laws. The most frequent crimes committed by those of this type is stealing. Many are guilty of forgery and deception, and crimes against the person occasionally occur. Their attitude toward legal punishment varies. Some are sullen and uncommunicative; others assume the attitude of martyrs. Their conviction often seems to aggravate their antisocial bitterness. Efforts at reformation are rarely successful. They are easily drawn again into the criminal life and become professional criminals or specialists in crime.

A considerable number of this group later develop psychoses with deterioration, especially the paranoid forms of dementia præcox.

(g) **The Quarrelsome Personality.**—These are individuals whose personal differences and situations tend to make them irritable and quarrelsome and who develop a permanent antagonism toward their environment. The most trivial incidents easily provoke bitter quarrels. They have an increased emotional excitability that easily leads to their becoming excited over trifles and various affairs in which they believe they detect injustice. This results in their taking an active interest in legal affairs and in this respect they have resemblances to the querulous paranoiac. They have, however, certain essential differences. They never develop delusions and their quarrelsome interests extend into all sorts of affairs. The interests of the querulous are largely limited to a few central events or experiences. Their attitude easily brings them into social conflicts some of which are of criminal quality.

**Forensic Relations.**—The problems involved in the social relations of the psychopathic personality are such as readily to bring about conflicts with the law and thus present questions of mental responsibility that are most difficult to decide. As a whole they contribute largely to the criminal and socially inadequate classes, and for this reason become of great importance for the criminologist. The constitutional character of their abnormalities makes ordinary reformatory measures difficult. For this reason one finds that they are relatively numerous among the recidivist class. The question of capacity for legal responsibility of the members of this large class is one that is not measurable by the ordinary tests laid down in the laws. Judged by the standards of ability to reason as to the nature and consequences of their actions they have the qualifications for responsibility. But the psychopathic individual even more than one who is normal may have definite psychotic episodes, usually transitory, that definitely exclude capacity for responsibility. Many of their crimes are committed during transitory disturbances of consciousness and hence must be judged differently from those occurring at other times. In other instances the capacity to reason and to judge as to their actions is disordered by the intensity of the emotions. This may be of a degree quite different from what the average normal individual ever experiences.

In general, they lack the lasting and serious disorders of the mental life that are present in those who have psychoses. They have no delusions nor any continued disorder of thinking that would prevent their correct reasoning as to situations or their actions. Nor are their mental functions impaired by deterioration.

Their difficulties lie almost entirely in the field of the emotions and in the influence of these upon their attitude and behavior. Their conflicts with the law are usually the result of impulses growing out of intensity or lack of intensity of feeling and defective inhibitions. Their problems are thus largely those of abnormal impulses. The question whether the impulse that leads to a criminal act of a psychopathic personality is of the irresistible quality recognized by the law as relieving

of responsibility is a matter most difficult to decide and must be passed upon in each individual case. There is no satisfactory way of determining just what impulses are irresistible and when. It is a question of the individual capacity to exert the inhibitions that should be possessed by the average individual against the normal or abnormal degree of intensity of a particular impulse. It is a question of whether the abnormal traits of the psychopathic personality have prevented him acquiring the strength of character that is possessed by the individual for whom the laws are made or if the emotional influences are of a degree and quality that is absent in the normal man.

From a psychiatric point of view the psychopathic personality presents a different problem before the law than the normal individual. These differences are more relative than absolute. While the question for the psychiatric expert to consider is that of capacity for legal responsibility, the courts must take cognizance of the ineffectiveness for the psychopathic criminal of the usual methods of treatment and punishment. Their abnormal qualities are inherent in their mental constitution and are such as to prevent in most instances their maintaining a normal social adjustment.

### PRISON PSYCHOSES

Mental disorders occurring among criminals while under arrest or in confinement present aspects that require special consideration. In many instances the disorder has no specific relation to the situation in which the criminal is placed, but are psychoses of well-differentiated types that have escaped detection until after the individual comes under observation or develop during confinement, *e. g.*, general paresis, dementia præcox, paranoid mental states, etc. A considerable number of the mental disturbances of prisoners are hysteric reactions that are precipitated by the trying emotional experiences incident to the punishment of crime. Generally these take the form of the Ganser symptom, the most prominent feature of which is the unclear state of consciousness.

As many of the criminal class are fundamentally of psychopathic constitution, reactions characteristic of this type of personality are frequently observed, such as episodic outbursts of excitement, periods of depression, quarrelsomeness, pathologic lying and swindling, and mild paranoid trends.

There are, however, certain psychotic disturbances occurring among prisoners that do not seem to be found elsewhere, and have such a characteristic symptomatology and relationship that they have been given the special designation of prison psychoses.

These have been specially studied by Rudin, who differentiates the following types: Paranoid states with (1) delusions of persecution; (2) delusions of innocence; (3) delusions of having been pardoned; (4) the querulous prisoners; (5) paranoid disorders of the degenerate.

The experiences incident to arrest and the legal procedure that prisoners must undergo produces an emotional stress that is difficult even for the average normal man. Often the reactions of the individual are those of excitement, outbursts of rage, or senseless actions. Others may



react with an attitude of depression with more or less complete lack of activity. They are frightened, tremulous, and take their arrest with no resistance. The various mental reactions of prisoners take on pathologic aspects when the symptoms are of great intensity or last unusually long.

**Paranoid States with Delusions of Persecution.**—While an attitude of being persecuted is a common reaction of prisoners and easily develops out of their situation and experiences, there are some states in which there develop definite delusions of persecution that are firmly held. These occur especially in those who are serving long sentences. Their subjugation to a rigid routine that gives little opportunity for an expression of their own feelings and initiative produces a bitterness and opposition that usually leads to other disciplinary measures. Their situation becomes more unbearable as their hope of ultimate release is removed. This and the bad hygienic relations under which they live react upon their mental life in ways that lead to the development of delusions of persecution. They are suspicious and paranoid toward what is done for them. They form the idea that they have been wrongly convicted and unjustly imprisoned. Often the outbreak of their delusions centers around some special experience as disciplinary measures, denial of a request for pardon or parole, or the imposition of an additional term of confinement after one has just been completed. Hallucinations sometimes accompany their delusions. They develop the belief that they have been wrongly convicted or that they are the victims of a "frame up."

The course and prominence of these symptoms depends much on the external situation of the prisoners. It may last a few weeks or many years. As long as discipline is severe the condition is aggravated. Removal to a hospital or placing under psychiatric observation brings on improvement. Rarely are the delusions ever truly corrected.

**Paranoid States with Delusions of Innocence.**—In some cases that have shown delusions of persecution the ideas of guilt tend to fade away and to be repressed from consciousness. Even the memory of the act and the experiences connected with it are forgotten. The prisoner asserts that he is not guilty; that he has broken no laws or that the witnesses were perjurers. There may even be a falsification of his orientation. There gradually develops a more or less break with realities and he drops into an autistic state, the content of which is determined by his wish longings.

**Paranoid States with Delusions of Having Been Pardoned.**—Among prisoners of advanced age and especially those who are serving life sentences there sometimes occurs a delusional state, the basis of which is the conviction that they have received a pardon. They may have been model prisoners for years and then suddenly express the delusion that for some time they have known that a pardon had been granted to them. They may describe in great detail how this came about. Generally there are also present other delusions, especially those of persecution. These patients usually show physical evidence of premature senility.

**The Querulous Prisoner.**—A fault-finding litigious attitude easily develops in prison confinement. Some feel that they are unjustly treated or that their conviction was unjust. The disciplinary measures that follow their hostility and opposition to their prison routine leads them to make complaints by letter or communications to officials and others who they think may be in a position to help them. The querulous delusion of innocence and unjust treatment is but a variety of the delusions of persecution.

To the foregoing types of mental disorders Kraepelin adds another that is characterized by rich delusional elaboration commonly of a varied and phantastic content. While in the characteristic prison psychoses the pathologic perceptions and ideas center around their prison experiences; in this type there are intermixtures with all possible relationships. The condition has resemblances to an hysteric dream state. The symptoms come on immediately after arrest or soon after the beginning of their confinement. At first the ideas seem to develop like the prison psychoses with delusions of persecution, but they are more theatrical. They speak of having heard some one call their name or make some insulting remark about them. Sometimes they hold dialogues with the voices. At night they have terrifying experiences. Delusions of persecution become prominent, but these are commonly of absurd and phantastic content.

Their ideas are constantly changing and have more the character of romancing and imaginations than true delusions. Consciousness and orientation are undisturbed.

Their actions are closely determined by their delusions. In many of these cases there are marked hysteric symptoms and the mental disorder as a whole, Kraepelin suggests, may have close resemblances to an hysteric dream state.

As in all psychogenic disorders of prisoners the course of this type is much influenced by the manner of treatment. Improvements and back sets vary with emotional situations that confront the prisoners.

**Simulation of Mental Disorders Among Prisoners.**—By this is understood an effort of the prisoner to convey a false impression as to his mental state, usually by imitating the symptoms of mental illness. The simulation of physical disease or nervous disorder to secure personal advantage is another matter and has been considered elsewhere.

In simulating insanity one finds usually that the part is overplayed and shows inconsistencies in the choice and continuity of the symptoms so that its true nature is easily detected. The prisoner commonly acts in accordance with the popular idea of insane conduct. This may be with an attitude of overactivity in which he yells, cries, grimaces, or rolls his eyes. He strikes out aimlessly or rolls about the floor. This state is greatly influenced by the presence of spectators and usually is absent when not under observation. It can usually be stopped by some unexpected or vigorous treatment. Instead of excitement they may assume the attitude of the stupid and silly dement and show oddities of posture and movements not unlike those observed in hysteric states.

The question of diagnosis of simulation may be more difficult in those instances in which the prisoner assumes an attitude of obstinacy or passive resistance. In this he may remain silent and give little or no information about himself. He follows the necessary routine aimlessly and without apparent interest. However, if carefully observed over a long period of time it will be evident that he has been much more interested than seemed apparent. This may be observed in his letters or in his reactions with others when not observed by the prison physician or attendants. In exceptional instances this attitude has been known to have been maintained for several years.

The greater number of those who attempt to simulate mental disorders are prisoners who show evidence of psychopathic constitution. Kraepelin finds that most of the instances of this that he has noted have been among habitual criminals, swindlers, and burglars, and that the simulation of insanity is not resorted to by the criminal of normal mental constitution. It is a mechanism used as a protective measure in those who are weak and mentally inadequate.

### INDUCED PSYCHOSES

An induced psychosis is one that is entirely caused by the influence of a psychosis in another. An illustration of this is where a wife accepts the delusional beliefs of her insane husband to be true. It would not include those instances when two or more members of a family develop a psychosis, uninfluenced by each other. Not uncommonly several cases of dementia præcox, of manic-depressive insanity, or general paresis may occur in a family without being induced by the disease of the other. One distinguishes the primarily diseased party and the party with the induced disorder. As a rule, the party with the induced psychosis is one of abnormal mental constitution and having unusual credulousness or emotional excitability. The disorder that is induced is of a type that lies more in the borderline between normal health and mental unsoundness than among the true psychoses.

Situations have an important influence upon the occurrence of an induced psychosis. Thus, they are more commonly noticed among members of the same family, in communities with narrow interests, or among religious sects.

The psychic disorder of the inducing party is, as a rule, one in which delusions are prominent, and the usual course of development is for the induced party to be led to an acceptance of the belief of the other party through feelings of sympathy. The mechanisms involved in the induction are not essentially different from those that determine the acceptance of beliefs and teachings in general. But here the beliefs accepted are not in agreement with realities and their effects are definitely pathologic.

The delusions that are induced may be of varied content. They may be delusions of persecution and the induced party takes the same view as the one who is primarily disordered. He may accept these as true, and in his attitude and actions support and defend the idea of the other.



Cases are cited in which a patient with delusions of suspicion and persecution influenced a member of the family to believe in his ideas, and in fear of their enemies they shut themselves in their house, kept off all help, and refused to eat because they both believed the food was poisoned. A rather common form of induced psychosis is in relation with religious delusions and experiences. The patient with delusions of being a holy person or one with a special mission influences others to accept his beliefs. A man who held the delusions that he was a prophet so infected his wife with his belief that she followed him through the streets carrying a banner. Even the hallucinations of patients may be experienced by others around them.

The influence of ideas and feelings upon others who are in close relations with them is seen in the biased viewpoints so frequently met with among witnesses who are especially sympathetic with the parties involved in a legal issue. Kraepelin cites the case of a woman who had signed some papers in a legal process and years afterward she developed the idea that what she signed were but blank sheets of paper. This belief she later influenced her husband to accept.

The forensic relations of the induced psychosis may sometimes have an importance in determining the source of beliefs and as an explanation of behavior that may come in conflict with the laws. It is a matter that should always be appreciated in evaluation of the testimony of witnesses in affairs in which the evidence may involve the questions of delusional influences.

The chief indication in the treatment of the disorder is to separate the patient from contact with the person holding the influencing delusions. As a rule, as soon as this is done the induced party improves. There are, however, instances in which the induced beliefs have become firmly fixed as delusions, and then treatment is less effective. Insane persons whose delusions are having a strong influence on those around them should early be removed from the community.

## MENTAL DEFECT GROUP

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### IDIOCY, IMBECILITY, AND FEEBLE-MINDEDNESS

"Real definitions are a standing difficulty for all who have to deal with them, whether as logicians or as scientists, and it is no wonder that dialectical philosophers fight very shy of them, prefer to manipulate their verbal imitations, and count themselves happy if they can get an analysis of the acquired meaning of a word to pass muster instead of a troublesome investigation of the behavior of a thing. For a real definition, to be adequate, really involves a complete knowledge of the nature of the thing defined. And of what subject of scientific interest can we flatter ourselves to have complete knowledge" (F. C. S. Schiller: *Studies in Humanism*).

**Definition.**—It is in some such spirit of open-mindedness that the neuropsychiatrist approaches the many searching problems brought about by the presence in the community of large numbers of mental defectives.

Although the importance of the general situation has been frequently outlined in the past twenty years by a comparatively small group of students of mental problems, it was only when the wholesale examinations were made by the draft boards and the trained neuropsychiaters during the World War of 1914–1918 that the gravity of the matter was forced into general recognition. Not only was it that almost a million illiterates were uncovered, but hundreds of thousands of mental defectives were revealed.

It has become therefore an absolute necessity for a more general understanding of the causes which have brought this situation about and a more extended application of practical medicolegal procedures to deal with the antisocial behavior of such defectives.

One of the first steps toward such scientific understanding and toward a better application of such legal procedures is to obtain a broad general view of the phenomena of mental defect itself.

Fernald, than whom no more duly qualified student of the problem can be found, has carefully gone over the problem from the statistical side, and we learn from him and from many others that at least 1 in every 250 of the population is a mental defective. This means at least a half million in the United States. No one has yet endeavored to estimate the cost of the keep of the 10 per cent. of these that are under custodial care, and as for the moneys spent by the community to keep the police and legal systems going, nearly one-half of the necessity for which is bound up in the feeble-minded problems, this is staggering, even to an actuary.

All of this, important though it may be, cannot be here taken up. A rich bibliography is available for any or all who care to know.<sup>1</sup>

We purpose here to outline first the meaning here applied to the group of mental defectives.



FIG. 214.—Idiocy associated with an epilepsy.

FIG. 215.—Imbecile, with extreme dolichocephaly.  
(Length-breadth index, 51.)

Human behavior from its mental aspect presents so innumerable a series of gradations—from that of the insentient idiot, on the one hand,



FIG. 216.—Idiocy associated with nemplegia.  
(Blainville cars.)

FIG. 217.—Imbecile with microcephalic head.

to the versatile, gifted genius on the other—that it becomes a highly difficult matter to separate particular trends and say just where and

<sup>1</sup> See Index Medicus, Surgeon-General's Library Catalog. Craft's Bibliography of Feeble-mindedness in Relation to Juvenile Delinquency; Journal of Delinquency, Sept., 1916, and Fernald, Reports of Massachusetts School for Feeble-minded; Journal of Nervous and Mental Disease, Mental Hygiene; Journal of Criminal Law and Criminology; Social Hygiene.



how one grades into another. Medical experience recognizes certain general variations from average standards due to degeneration or to lack of development. In their extreme grades these are readily classified, but as the individual more closely approaches the average human mind with which the observer is familiar, the difficulties in the way of an accurate demarcation become marked. It is for this reason that it is almost impossible to formulate definitions for the varying grades of mental development. The definition must seek to embrace not only the central, well-recognized features, but also the outlying, dim, and hazy gradations which pass over into other groups.

Although medical science sees only a series of gradually varying forms, legal procedure needs sharper lines of distinction drawn between the terms idiocy and insanity, as well as between all qualitative words that describe an individual as being imbecile, feeble-minded, or a natural fool, and such terms as define his state as being demented or crazy.

The mental defective proper, including all its degrees, from the state of inert, idealess, insentient existence to the state of the mild grades of feeble-mindedness, is a result of arrested development, and not a result due to a regressive process in a previously average mentality.

From birth, as a rule, or from disease in early childhood, before the mind attained much degree of development, an accidental or degenerative condition of the brain prevents its natural evolution, so that the faculties which in normal childhood develop by observation and imitation either never develop at all, or else so slowly as to keep the individual in a class by himself.

The older students of the problem were content to define the whole group in very vague terms, but with the advent of Binet's (1904-1911) studies on the intelligence of the child an entirely new group of practical measures have been devised which have made the whole problem much more precise and comprehensible.

For practical purposes the whole mental defective group may be divided into three general classes: the idiot, the imbecile, and the feeble-minded or morons. The idiots are those of the least mentality; the imbeciles those of next higher grade, and the morons those more closely approximating what Binet found was the average adult about twelve years of age. Before Binet elaborated his scale of tests, since which many useful variants, additions, and helpful modifications have been made, no distinct levels of demarcation were made between the idiot and the imbecile, or the latter from the moron, and as for the higher groups they graded off insensibly to the average adult. The chief criteria followed individual ideas concerning dress, conduct, deportment, etc. Binet assumed that the most useful plan was to follow that of language development as a criterion, and then elaborated his tests. According to this general scheme the idiot never reaches the plane of spoken language; he is limited to the use of gesture, he falls within the general intelligence scale of one and two years of age; the imbecile understands spoken language, and talks with varying fluency; according to intelligence tests he groups as three, four, five, six, and seven years of age;

the moron is able to read and write in addition to his understanding of language and his ability to use it; his age group according to the tests is eight, nine, ten, eleven, and twelve years; above the intellectual age of twelve the feeble-minded or moron does not progress. This was the general scale as made out by Binet and his assistants from a study of the school children of Paris made during a period of about ten years.

These initial tests have been made the subject of the most intensive study by scores of pedagogs, psychologists, neuropsychiaters, and others. The general character of these cannot be entered into here. New magazines have been started dealing exclusively with the type of problem which Binet's researches have prompted.<sup>1</sup>

The upshot of the whole matter has been that the psychologic investigations of grades of intelligence have contributed a mass of extremely valuable material, and that the present attitude for the judicial determination of the grade of mental defect should rest upon a modern up-to-date utilization of the methods of testing for intellectual age of the individual in question. Just what type of scale is used is a matter of only slight consideration, but that intelligence can be measured for medicolegal purposes is established without the least shadow of a doubt. To neglect the help offered by such psychologic testing by competent individuals is to commit a grave offense. The discussion of the tests cannot here be taken up, nor their affiliation with other types of neuropsychiatric examinations. These can be found in the bibliographies already quoted and in other publications.<sup>2</sup>

**Idiocy** may then be defined as that group of the mental defective whose mental capacity is that of the one or two year old child as determined by psychologic tests.

The term "idiocy" in the older terminologies, and still unfortunately retained in jurisprudence as including the whole group, is properly confined to the lowest state of mental incapacity as here defined. The idiot proper is one who is able to give little or no care to his person, who is barely able to express his material wants, and utterly incapable of any intelligent communication. He is often unable to walk or to make co-ordinated movements because of a great variety of structural defects. The movements of which he is capable are awkward and ungainly; his steps are uncertain, and he does not perceive impediments or danger when he walks. He has little capacity to direct his wishes, and his behavior resembles that of lower animals.<sup>3</sup> The lack of intellectual development is a peculiar physiognomy and utter absence of expression, a vague, unintelligent, unrecognizing look. A state of con-

<sup>1</sup> Most useful summary of bibliography of Psychological Tests. See Helen Boardman: Bureau of Educational Experiments, Bulletin 6, New York, 1917. Also see Hollingworth, Vocational Psychology. Whipple: Manual of Intelligence. Tests. 2d ed. Thorndike, Mental and Social Measurements. Yerkes, as head of the Applied Psychological Department made a series of important tests of the drafted men. See Psychological Bulletin and Psychological Bibliographical Index.

<sup>2</sup> See Wimmer: Neuropsychiatric Examinations. White: Outlines of Psychiatry; Mental Mechanisms.

<sup>3</sup> See interesting study of such an idiot along lines of animal behavior studies, de Jong, Jour. Nervous and Mental Diseases, 1921, 54, 1.

Mental age.	Capabilities.	Class.
Under one year	Helpless.	Low
1 year	Feeds self. Eats everything.	Middle
2 years	Eats discriminately.	High
3 "	No work. Plays little.	Low
4 "	Tries to help.	
5 "	Only the simplest tasks.	
6 "	Tasks of short duration.	Middle
7 "	Little errands in house. Dusts.	Middle
8 "	Errands. Light work. Makes beds.	High
9 "	Heavier work. Scrubs, mends, lays bricks, cares for room with simple furniture.	Low
10 "	Good institution helpers. Routine work.	Middle
11 "	Fairly complicated work with only occasional oversight.	
12 "	Uses machinery. Cares for animals. No supervision. Cannot plan.	

Jelliffe and White: *Diseases of the Nervous System*, 4th ed., 1922; Jelliffe: *Technic of Psycho-analysis*. Church and Peterson: *Text-book of Neurology and Psychiatry*, 9th ed., 1919.

tinued apathy, a lack of all voluntary effort, a total absence of memory, with only a peculiar cry or sound instead of speech, physical stigmata of degeneration, and bodily deformities, including peculiar formations of the skull that are nearly always present—these are the marks that make up the physical and mental picture of the profound idiot.

**Imbecility.**—The mental defect is by no means so complete in all cases. It is to be separated from idiocy on the basis of the intelligence tests. The imbecile groups three, four, five, six, or seven years of age, as checked up by the Binet-Simon, Tesman, or other type of scale. Owing to congenital defect or to an effect proceeding from arrested development due to disease or accident, the brain of such an individual is not capable of average development. The imbecile is generally able to take care of his person and dress, attend to his physical wants, to understand what is said to him, to carry out simple orders, and to perform certain routine duties. His psychical organization often differs but little from the average standard of the three to seven year old child; and, unless paralyzed, the imbecile has the use of his muscles. His countenance is capable of showing emotions, although these are often manifested by mischievous, evil, cunning, silly, or hilarious expressions. They are incapable of receiving abstract ideas, and though they may appear quite intelligent in one line, as, for instance, having musical ability, being able to do difficult problems, or having a remarkable memory or mechanical aptitude, yet in all other respects their judgment and memory are limited. Although speech may be impossible to a somewhat intelligent imbecile, yet, as a rule, the degree called imbecility, as distinguished from that called idiocy, is characterized by the fact that the imbecile has the power to speak with some degree of in-



telligence, while idiots are incapable of speech, save, perhaps, the utterance of single words. In imbeciles the speech is often slow, hesitating, irrelevant, and purposeless. It takes time for them to



FIG. 218.—Idiocy as a result of an acute psychosis in childhood.



FIG. 219.—Idiocy due to a brain disease, which also caused epileptic seizures.

grasp a simple idea, and the comprehension, as well as the expression of a complex idea, is beyond them.

**Feeble-minded.**—The highest group includes the “backward



FIG. 220.—Microcephalic imbecile—good-natured and a fair worker.



FIG. 221.—Good-natured imbecile—fair worker.

children”—*enfants arrières* of the French, the *tardivi* of the Italian, and the *Geistig-zurückgebliebene* of the Germans.

As indicated the term “feeble-minded” or “moron” is applicable to that group of individuals who test up between seven to twelve years

of age as judged by the special psychologic methods already referred to. The value of the use of such tests is repeatedly shown and the present tendency in the so-called Children's Courts and Research Departments connected with the courts is to refer all cases of delinquency to such examinations before sentence is passed.

That such measures have not come into more general use throughout the United States is to be deplored, as the study of delinquents and criminals in many state penitentiaries, workhouses, etc., demonstrates that delinquency and feeble-mindedness are very intimately interwoven.

Not all of the feeble-minded are delinquents, however; many make fairly average citizens, or have been considered as such, as witness the many thousand who were weeded out by the neuropsychiatric examiners in the recent draft board examinations. A feeble-minded man may make a strong, efficient hod-carrier, and pass through life, marry, and advance himself without creating any comments on his incapacity; whereas the same lack of mental capacity in one of the family of thinking men and women would, by contrast, set the individual apart from his fellows. The feeble-minded or the higher grade of imbeciles often make trustworthy and devoted servants and may be capable of faithful routine work.

*Idiots savants* are those that exhibit some unusual power that would be remarkable in an average individual, but in one mentally lacking in other respects is phenomenal. Some have a remarkable memory for certain things; others can calculate with lightning-like rapidity; some are intensely imitative; while others have histrionic or musical powers. Such idiots usually find their way into museums or become local freaks. Blind Tom, the musician, was of this class. Such cases are congenital and are very rare. Court-fools and jesters were probably of this class of idiots with some specially developed faculty that made them a source of amusement as well as a butt, though history shows that later to play the fool became a profession, and that even the clown of the present day apes the simple-minded to make his buffoonery and wit tell by contrast. The psychology of this uneven development is little known, and even were the psychologic processes which underlie certain aptitudes known, there would still remain the mystery of the manifestations of particular talents or faculties in minds otherwise blank or defective.<sup>1</sup>

**General Etiology.**—A comprehensive and at the same time suggestive grouping of the causes and types of mental defectives is as follows<sup>2</sup>:

1. Historical groups:

Defective through lack of training.

Defective from loss of sense organs: Deafness, muteness, etc.

<sup>1</sup>For study of talent and brain structure see work of Cecile and O. Vogt, *Journal für Psychologie und Neurologie*, 1920, 1921.

<sup>2</sup>Ziehen: *Die Geisteskrankheiten des Kindersalters*, 1915. Weygandt: *Die Gruppe der Defektzustände des Kindesalters*. Aschaffenburg's *Handbuch der Psychiatrie*, 1915. A Marie: *Traité de Pathologie Mentale*. Tredgold: *Feeble-mindedness*.

## 2. Endogenic groups:

Microcephalic; defective brain evolution.

Amaurotic family idiocy.

Tuberous sclerosis hypertrophy.

Mongolian degeneration.

## 3. Infantilism types:

(a) Dystrophy from faulty nourishment; intestinal disease, cardiac or lung disease, alcoholism, infections, tuberculosis, syphilis, malaria, pellagra.

(b) Endocrinous infantilisms:

(1) Thymic idiots and status thymolymphaticus.

(2) Dysthyroid defectives: Cretins, myxedematous, goitrous.

(3) Dygenitalismus: cryptorchids, eunochoid idiocy.

(4) Hypophyseal dystrophies: adiposogenital syndromes; acromegalics with defect states; pituitary epileptics, hypophyseal dwarfs.

(5) Pineal defect states.

(6) Suprarenal defect states with faulty cardiovascular systems.

(7) Pluriglandular.

## 4. Brain inflammatory disease group:

(a) Inflammation of brain; encephalitis of various types with secondary microcephalus, microgyria, atrophic sclerosis, gliosis, porencephaly, hydrocephalus from tuberculosis, etc., Syphilitic inflammatory disease, cerebral hemorrhage, with Little's disease types, athetotic types.

(b) Meningeal inflammations, with chorea and feeble-mindedness: spasmophilia, rachitic.

## 5. Brain toxemias:

Hereditary syphilitic types; alcoholic, lead intoxications.

## 6. General:

Chondrostrophia and other bony dystrophies, oxycephaly; tumors of the brain, multiple sclerosis; hereditary spinal palsy; lenticular degeneration and Wilson's disease; pseudosclerosis, Friedreich's disease; and other cerebellar disease types; amyotrophic lateral sclerosis; traumatic.

## 7. Idiocy complicated by or occasioned by:

Severe neuroses: psychoneuroses from affective blocking; manic-depressive types; schizophrenic types.

In tracing the relations of mental defect to heredity<sup>1</sup> it is impossible to ascribe the majority of cases to any one specific cause; rather it is true that it is the result of several contributory factors. Drunkenness, consanguinity, neurotic tendencies are not alone apt to cause defectives in the offspring, but in combination with unfavorable environment they tend to mental degeneracy. The opinions of many authorities drawn from statistical studies seem to show some form of neurotic inheritance

<sup>1</sup> Consult Davenport, Mental Defect and Heredity, Eugenic Record Reports.



in about 40 to 50 per cent. of the mentally defective. Parental intemperance is a cause of progressive degeneration resulting in mental defectives in 9 to 16 per cent. Hereditary syphilis is found in from 20 to 40 per cent. of the mentally defective. Consanguinity of parents or grandparents, by accentuating a family weakness, contributes about 5 per cent. of cases.

Gestational causes vary, according to the statistics, from 11 to 30 per cent. Parturitional factors, such as premature birth, pressure of the cord, asphyxia at birth, meningeal hemorrhage from prolonged labor, forceps injuries, which, however, are less injurious to the infant than tedious labor, are active in about 18 per cent. of cases. Infantile convulsions causing or accompanying meningeal hemorrhage occur in a large number of cases—about 25 per cent. Statistics show that cerebral diseases (meningitis, hydrocephalus, hemorrhage, thrombosis, embolism, tumor, and abscess) follow infantile convulsions in 8 or 9 per cent.

Acute febrile diseases, such as scarlet fever, measles, whooping-cough, typhoid fever, small-pox, and diphtheria, induce mental defect in some 6 per cent. of the cases.

Trauma to the head, mental shock, "cramming" at school(?), and sun-stroke result in, according to "statistics," perhaps 2 to 5 per cent. of the cases of mental defect.

**General Symptomatology.**—Since mental defect, in all its varying grades, depends upon some sort of congenital or acquired defect or disease of the brain that interferes with its evolution, it is clear that the cerebral functions may all be more or less involved, and that no particular psychic faculty can be selected as the one whose disorder retards or influences the development of the other faculties.

A systematic order of examination of the senses, the habitual movements, the moral aptitudes, and the personal appearance of any person whose mental capacity is thought to be below normal will be of advantage in assisting an examiner to determine in what respect the individual is lacking. In making tests by observation and questions concerning the state or the degree of mental defect, the examiner should always bear in mind the opportunity that the person has had for obtaining education, and try to test the extent to which he has shown himself capable of being instructed. The mind of one who is supposed to be imbecile should not be compared with that of an individual who has improved every advantage of education and culture; but as nearly as possible with the mind of individuals of average capacity of the same age, the same social station, and the same environment and education. All that one must look for is an average capacity for performing one's duties, showing that the person has an average development of the intellectual faculties. The conclusions regarding the competency or incompetency of an individual must be derived from an examination of *all* his faculties. These requirements are well filled in all of the most recent intelligence tests to which reference has been made.<sup>1</sup>

The examiner must endeavor to ascertain how far the weak mind of

<sup>1</sup> Consult in detail, Healy, *The Individual Delinquent*, 1915.

the individual would prevent him from attending to his own interests; not whether he attains the standard of proficiency of his brothers or neighbors, but merely whether, in his particular walk in life, he is able to manage his duties and affairs without involving his own property and the property of others in ruin.

Questions of a legal nature seldom arise in connection with profound idiots; expert testimony in connection with such generally is demanded for the sake of ascertaining whether or not, from the nature of their affliction, they are capable of development; whether their deficiencies are wholly due to disease of the brain or to accident, or in part to lack of training. It is for the minor grades of feeble-mindedness that the greatest care and judgment are necessary to determine whether or not the degree of intelligence, either natural or cultivated, that the individual possesses is sufficient to hold him responsible for his acts and to justify his family or the state to allow him to go without supervision.

Following somewhat the natural order in making examinations, the sense perceptions of idiots may first be taken up.

**Sight.**—Between 7 and 8 per cent. of mental defectives are congenitally blind. It is, however, necessary to determine whether the blindness is due to some lesion of the visual apparatus or to lack of attention.

Blindness does not preclude the possibility of education, for some mental defectives with absence of this sense have been educated to a moderate degree. When mental defectives can look, without really seeing, the apparent blindness is due to a lack of attention. When there is no visual defect, the attention may often be cultivated by attracting the gaze by bright objects, and once it is caught, the latent sense may be drawn out by many devices familiar to the kindergartner. Particolored balls, bright stuffs, shaded wools, spheres, cubes, squares, vividly colored pictures, all play a rôle in the education of the vision of the defective pupil. In the playing of games, such as dominoes, ball, croquet, marbles, bean-bag, the vision is stimulated and improved, and there is a gain in manual dexterity and an associated development of some of the psychic functions. In the higher grades of morons vision may be as good as in the average man; but many show certain visual and ocular defects, such as hypermetropia, defective color vision, strabismus, nystagmus, congenital cataract, inequality of the pupils, microphthalmos, and the like. Hemianopsia is at times present in hemiplegic idiocy or imbecility.

Good binocular vision is uncommon in mental defects. As a standard of comparison it must be remembered that, according to Preyer and other writers on the development of the child, by the end of the second month the eyes are usually co-ordinated and the child follows a moving light with accuracy. At the end of the third month it recognizes its father and mother; at the end of the fourth month the eye movements are perfect; at two to two and a half years it distinguishes color correctly.

**Hearing.**—It is not always easy to distinguish whether an idiot is deaf from defect in the auditory apparatus or is only sensorially deaf.

Mental defect of a mild degree is not infrequently induced by deprivation of this sense. Deaf-mutism is not common in many defectives. In individuals like Laura Bridgman and Helen Kellar, who might have deteriorated to defective states in spite of otherwise average brain capacity, wonders have been accomplished by educating the mind through the other senses. In morons hearing is nearly always normal. Deaf-mutism cannot be considered common. The average child hears on the fourth day; turns its head toward sounds at the end of the second month; and listens to the ticking of a watch, with attention, at the end of the third month. Defective hearing that is due to a want of attention rather than to deafness has to some degree been remedied by first gaining the attention by means of gongs, bells, or even a pistol shot; and then holding the attention until it becomes an avenue for impressions from the environment to travel to the brain for registration, and the arousing of new cerebral activities. Jingles and music seem to be especially attractive to the imbecile or idiot whose hearing is deficient through lack of attention.

**Taste.**—This sense is frequently affected. Gluttony is a marked feature in the lower types of mental defect. It is common for idiots to eat without mastication. Many, especially the higher grades, present a precocious taste for alcohol. A difficulty in distinguishing the simple taste sensations (salt, sweet, bitter, and sour) is often met with in defectives of a mild type, as well as in the more marked cases.

The average child shows that it distinguishes between tastes that are pleasant and unpleasant first at the end of a week, and very decidedly when a few months old.

**Smell.**—In idiots the sense of smell may be absent or much perverted. In the average child this sense is present at birth. The sense of taste and of smell open many avenues of general education to the brain. In fact, the earliest evolutionary advances utilized the olfactory and gustatory pathways. The rhinencephalon is one of the most important parts of the brain and smell education is of great value.<sup>1</sup>

**Tactile Pain and Muscular Sensibility.**—As a rule, sensibility to touch and pain is uniformly diminished in idiots of all degrees, mostly through lack of attention. The self-mutilation of some idiots points to a defect of pain sense, and idiot women have been known to bear children without experiencing the pains of labor. There may be complete anesthesia and analgesia, particularly in idiots of a low grade. On the other hand, as in the Bridgman and Kellar cases just mentioned, where the sense of touch was the chief avenue to the brain, by reason of the impairment of sight and hearing, the tactile sense may be educated to a high degree of delicacy.

**Thermic Sensibility.**—Though idiots are not, as a rule, very sensitive to heat and cold, their vasomotor systems are susceptible to the influence of cold and exposure, and their low resistance to external influences and disease is such that many die of pulmonary affections. Some

<sup>1</sup> Elliot Smith, *Significance of the Cerebral Cortex*, Croonian Lectures, Brit. Med. Jour., 1919.



become more stupid in cold weather and brighter in warm weather, while in some fever is accompanied by evidences of increased mental activity.

**Movements.**—On going through an institution for mental defectives one is struck by the peculiar and constant movements they make. A few may be inert and motionless, but most are bending either backward and forward or from side to side with a rhythmic, swaying movement of the body. It is very characteristic that such movements are concentrated about the genitals and anal or other erogenous zone.<sup>1</sup> Sometimes the hands are slowly flexed and extended and brought up to the face in movements similar to those in athetosis, but differing from them in that they are wittingly performed. Walking to and fro, rotating, dancing, and so on are more elaborate forms of the same tendency toward constant motion.

There is nearly always a difficulty, out of all proportion to the intellectual development, for the lower grades of mental defect to perform associated movements with a definite aim. The automatic impulsive movements seen in many mental defectives are rich in neuropsychiatric significance which modern analysis of the cerebral, cerebellar, and striatal components of movement are rendering more and more comprehensible. The smiles and grimaces so constantly observed in idiots and imbeciles are to be studied from the same point of view. Masturbatory activities are very markedly in evidence, and include the masturbatory use of a number of erogenous zones.<sup>2</sup>

**Right-handedness and Left-handedness.**—Some 12 per cent. of all children are left-handed; but while 88 per cent. of normal children are right-handed only 72 per cent. of defectives use their right hand in preference, the remaining 18 per cent. being ambidextrous.

**Voluntary Movements.**—Many idiots never learn to walk, while others acquire the ability very late. This is true of the other functions of daily life that are usually learned in childhood by imitation, such as carrying food to the mouth, and so on; such actions requiring the use of the voluntary muscles are either never learned or acquired very late, and slowly, as the result of educational development.

**Organic Sensations.**—The keenness of the visceral sensations is more or less diminished in all idiots. The sensations of hunger and thirst are often lessened, although very rarely absent. The feeling of satiety after a hearty meal is seldom felt by them; so that if left to themselves most idiots and imbeciles will eat on indefinitely. The control of defecation and micturition is not attained at all by profound idiots. In the lower and middle grades of idiocy it is often difficult to diagnose visceral disease, owing to the bluntness of the somatic sensations, and idiots may die without making any comprehensible complaint. The feeble-minded and imbeciles not infrequently

<sup>1</sup> See Clark and Atwood, *Habit Movements in Mental Defectives*, Jour. Amer. Med. Assoc., March 23, 1912.

<sup>2</sup> Freud, *Three Contributions to the Sexual Theory*, Nerv. and Ment. Dis., Monogr. Series, No. 7.

mislead the physician by exaggeration, concealment, and falsehood concerning their symptoms.

**Attention.**—It is largely through the faculty of attention that progress is made in mental development. It is characteristic of the mental defectives that they lack this faculty in a greater or less degree, which is noticeable in proportion to the amount of attention that is necessary for the work given them to do. The faculty of attention when resolved into its elements includes, first, the integrity of sensory impressions delivered to the brain, which the defective senses of the defective convey but feebly; second, a pleasurable or painful, or at least an interested, perception of these sensations, which is noticeably lacking in mental defectives; and third, motor expressions of the impressions received in the limbs, body, face, or eyes. These motor expressions, by reason of general weakness, paralysis, contracture, epilepsy, chorea, ataxia, automatic and impulsive movements, are greatly deranged in idiocy and imbecility.

On the development of both spontaneous and voluntary attention depends the general development of intelligence in the mental defective. In some idiots the lack of attention is so profound that no education is possible; but in others, where there is even a slight degree of spontaneous attention, it may be developed into voluntary attention by stimulating the sense that is most developed. This is generally that of sight.

By means of exercises of attention it is possible to diagnose the degree of intellectual weakness. From the absolutely ineducable idiots there are all degrees of attention. Some exhibit it in flashes, as it were, of brief duration, and faint in nature; still others are capable of prolonged and habitual attention; and with these only is it possible to make any advance in education. Since the power of attention to external events is so feebly developed in idiots it is not surprising that attention to internal happenings or reflections should be totally absent in all grades of idiocy.

From a sociologic point of view the imbecile is a much more dangerous member of society than the idiot, for the latter, by reason of his lack of voluntary attention, is incapable of forming any idea of injury to his fellows. Sollier calls the idiot *extrasocial*, and makes the imbecile quite distinct as antisocial, claiming that in the latter there is an undefined amount of voluntary attention, combined with a relative, though perverted, intelligence, which two factors render him often a dangerous member of society.

This instability of attention causes the imbecile to pass from one subject to another without comprehending their relation. He grasps the first part of a sentence and pays no heed to the remainder. He asks questions and does not wait for an answer. He accomplishes what labor he is capable of in an automatic way without due appreciation of the object of his work. He begins work and forgets to finish it, because he is incapable of holding his attention to it.

Any distinction, however, between idiots and imbeciles and feeble-

minded persons, on the basis of attention, can be one of degree only. The adult imbecile in the middle grade would have the varying and imperfect attention of a backward child, and his ideas, speech, and conduct would vary with his temperament, with his docility, and with his perversity. Imbeciles may be uncertain, mischievous, indolent, and antisocial; on the other hand, they may be good-natured, trusty, docile, and industrious.

**Reflection and Preoccupation.**—That internal form of attention in which images and ideas constitute the subject matter is absent in the lower forms of idiocy, but present in varying degrees in imbecility and feeble-mindedness. Few imbeciles dwell on any mental subject, though they often have a fixed idea. Some commit criminal deeds which seem to be suggested by a perverted tendency to be interested in bad actions. They are generally too selfish to care for the troubles of others and too stupid to have intellectual preoccupations.

**Instincts.**—The control and guidance of instinctive behavior of idiots are defective. Hunger is usually present, with no power of governing the gratification of the appetite. The instinct of self-preservation is impaired in nearly all, absent in profound idiots, and ungoverned by proper judgment in milder forms. In some there is little evidence of the sense of fear, and self-injury is possible. Suicide occurs in imbeciles and feeble-minded folk sometimes without determinable cause; sometimes, as a morbid impulse.

Sleep is generally good in the feeble-minded. It may be both profound and excessive; whether they dream and can tell their dreams or not depends on the degree of their mental development.

The expression of the instinct of race propagation may be absent, impaired, exaggerated, or perverted. It is seldom normal. Mental defectives present many degenerative stigmata with reference to the genital organs. These are usually more numerous in direct proportion to the mental impairment. Among these anomalies are: cryptorchidism, unilateral or bilateral microchidia, spurious hermaphroditism, insufficient development of the entire genital apparatus, hypospadias or epispadias; defect, torsion, or great volume of the prepuce; median fissure of the scrotum, imperforate meatus, abnormally large or small labia, excessive development of the clitoris, hypertrophied labia minora, pigmentation of the labia minora, imperforate vulva, atresia of or double vagina, and uterus bicornis. Puberty is often retarded, but occasionally is early; often it is normal.

Masturbation of all types, genital, anal, oral, skin, muscular, urinary, etc., is exceedingly common among all classes of mental defectives of both sexes. Various sexual psychopathies of a revolting nature are extremely common with them.

Mental defectives show strongly the habit of imitation, which, however, is purely a passive and seldom an intellectual or active imitation. It is most frequently shown in the imitation of the acts and language of the vicious, coarse, and vulgar.

**Special Aptitudes.**—These are usually in the direction of music,



mathematics, the mechanical arts, building, wood-carving, drawing, painting, memory for facts or dates, playing games, and of a low order of wit or drollery. Music, the most sensuous of the arts, seems to appeal especially to this class of individuals, and many unteachable idiots are able to hum tunes.

**Play.**—There is a lack of the play sense in all defectives, and, in direct proportion to the degree of mental development, of natural active play. Normal children learn accuracy and concentration of attention in play, and in the development of the feeble-minded kindergarten games are employed to supply this deficiency. Simple games that require a little computation, such as dominoes; or that demand some slight accurate co-ordination of the muscles, such as bean-bag and ball, are exceedingly helpful. The natural tendency of the lower grades of morons is to play in a solitary way, while the higher grades often seem to enjoy noisy, rough, destructive games, which they sometimes carry on good-naturedly, but often in a quarrelsome, irritable manner.

**Destructiveness.**—Most mentally defective children that are capable of action are destructive. In the higher grades this tendency, if not educated, may make them dangerous. Their inability to foresee consequences and their pleasure in bright sights and loud sounds often lead them to kindle fires, burning themselves as well as valuable property; to smash windows and dishes, and to beat animals or children. This they do with evident delight. By means of skilful discipline they learn to associate punishment with questionable acts; but it is doubtful whether they ever learn to restrain themselves from a purely moral sense. Cases are on record, however, of mental defectives who had killed children and men, and who, nevertheless, had become mild, good-natured, docile, and affectionate under wise institutional care.

**Sentiments.**—In the lowest forms of idiocy the sentiments and sensations are rudimentary or altogether absent. As a rule, one may discover various degrees of pleasure or pain, affection, pity, fear, social proclivities, love of property, regard for rights and duty, obedience, shame, esthetic feelings, curiosity, and the like.

**The Emotions.**—Pleasure and pain are indefinite or absent sensations in idiots, felt to a greater extent by imbeciles, and well marked in the feeble-minded. Idiots are subject to sudden outbursts of laughter as well as to sudden outcries. Moral pain or remorse is generally wanting, though in some cases it may be developed to a slight extent. They live in the present only, and do not concern themselves about the past or the future. They do not often weep, and when they do, it is for some trivial thing, not for a moral or mental pain, though many of them are susceptible of having their emotions worked upon as if they were little children, and will cry if they are scolded. Some imbeciles always have a good-natured smile and laugh excessively over nothing; but true humor and real sorrow are not in an idiot's capacity for feeling.

The mentally defective in rare cases only seem capable of the passion of love, though they often possess affection for their caretakers and a blind, animal-like devotion to those who are kind to them; for, like the

animals, they are susceptible to gentleness and kindness, and it is through such treatment that they are most easily managed. Harsh words and rough treatment almost invariably render them either obstinate or perverse or cowed and stupid. The degree to which an imbecile or feeble-minded person is capable of affection or friendship depends on the degree in which the moral sense is developed. Some show a sort of love for their family, and others are hateful and spiteful at home. Often the feeble-minded in asylums show a fondness for one another. The older ones pet and jealously guard certain of the children; often their friendships for one another are based on a desire for mischief or are erotic in their nature. Some mental defectives inflict pain from ignorance of the effect of their actions, and others are viciously cruel.

*Jealousy* and *pity*, which are naturally correlated with love and tenderness, are nearly always absent in the mentally defective.

Nearly all of the feeble-minded are beset with *fears*, often of natural phenomena or unusual circumstances; and by reason of this lack of understanding that would explain the cause of their fears, as well as the greater credulity they possess, they are often needlessly tormented. Courage is quite unknown. Anger is very common in all degrees and in every age. It shows itself in paroxysms of ungovernable rage that only get worse in attempts at restraint. This, like all the moral defects, is due to the lack of inhibition, which is the physiologic basis of self-control. A very slight irritation may produce a wholly incommensurate outburst, leading to the infliction of injuries on self or others.

**Character.**—Most imbeciles and feeble-minded individuals have a childish propensity to collect all sorts of useless objects and trifles. One will fill his pockets with stones and dirt, another will collect pencils, buttons, and various trifles. They will often steal what they want, and some seem to be incapable of any recognition of the property of others. The feeble-minded are apt to be very untruthful and deceitful with reference to their faults and doings and things found in their possession, though naturally their attempts to deceive are very childish and transparent.<sup>1</sup> Even simple morons may be taught absolute and prompt obedience, so that they may be relied upon for the performance of simple duties; but, on the other hand, some of the most intelligent are perverse in their refusal to submit to discipline. Some can be made to work only by means of reward; others are made vain and conceited by praise. Punishment is nearly always useless, as the idiots do not understand its cause, and the higher imbeciles are made resentful.

A true *religious sentiment* is unknown in any form of idiocy; but in institutions for the education of the feeble-minded, religious feeling is often developed along with love and affection, and simple religious services appear to please them. The mentally defective differ from one another in character, though not so markedly as average persons do. Some are naturally morose, others naturally happy and jolly. In

<sup>1</sup> See study by Healy, *Pathological Lying, Accusation and Swindling*, Criminal Science Monograph, 1915.

profound types there are often sudden accesses of excitement without cause; while in the higher types the character is similar to that which the normal character of the individual might have been were it not marked by inconstancy, a weak will, a blunting of the sensibilities, and a loss of reasoning powers.

**Physiognomy and Expression.**—The mentally defective nearly all show some deficiency in their general appearance. There is always something ungracious, uncouth, ugly in their figures, faces, attitude, or movements. Misshapen or asymmetric heads, dwarfishness, lack of proportion of the thumbs, stooping and slovenly postures, deformities of the hands or feet, and awkward and wobbling gait are extremely common. The expression of the face may vary from complete apathy and absence of intelligence to a considerable play of features of a low order, such as constant laughing, making faces, leering, or scowling. Besides the absence of those facial traits which are made on the face by the mind, the ugliness is generally added to by asymmetry, disproportion, or deformity of the features. The eyes may be too close together or too far apart, or deformed by disease of the iris, cornea or lids, or by squint. The nose is deviated or is malformed, the ears are unshapely and unequal, the mouth half opened, the teeth diseased and neglected; the chin deviated, prominent, or retreating; the forehead low and bulging or inclined. Microcephalus, oxycephalus, and cretinism give their own ugly individuality, too well known to need description here.

**Language.**—Imbecile children are very slow in learning to speak. The lower classes of idiots never learn to talk at all. Imbecile children have learned to speak as late as twelve years of age, but, as a rule, if they do not learn before seven years of age, they are never apt to learn.

A large number of the mentally defective never speak because their ideas are too simple to need expression. Often they know their friends without being able to name them, and want things that they cannot ask for.

Ireland states that he has found, in twenty years' experience with feeble-minded children, that when they use words they do not use them through mimicry of sound, but to mean ideas; they either speak with a meaning or not at all. Stammering is oftentimes found in those imbeciles who often talk a great deal, and without definite object; in those who have onomatomania, and in those who are subject to transitory attacks of excessive maniacal loquacity.

## INTELLIGENCE TESTS

After much preliminary investigation a very near approach to a satisfactory standardized scale of measurements of intelligence has been attained in the so-called Binet-Simon method as modified by Terman.<sup>1</sup>

These tests are selected to determine so far as it may be done the

<sup>1</sup>The Measurement of the Intelligence, by Lewis M. Terman, Professor of Education, Leland Stanford Junior University, Houghton Mifflin Co., Boston.



conditions of memory, powers of reason, apperception and comprehension, ability to compare and to combine, time orientation, store of concepts, facility of using number concepts, and knowledge of common objects.

In this so-called Stanford revision of the Binet tests now in general use, copied below, there are six tests for each year from the age of three years to ten years, eight tests for the twelfth year, six for the fourteenth year, then six tests for the average adult and a final catalog of six tests for the superior adult. Up to and including the tenth year each test is assumed to represent two months of the age. In year twelve the eight tests represent three months each or twenty-four months (eleventh and twelfth years). The year fourteen has six tests each representing four months, or twenty-four months for the years thirteen and fourteen. In the average adult tests the six tests represent five months each and in the superior adult six tests represent six months each. Since the native intelligence analyzed by this method does not change much if any after the age of sixteen years, the scheme is applicable to all ages. In the table of tests the letters Al. signify alternative tests. Following is a copy of the Stanford system:

**YEAR III. (6 tests, 2 months each)**

- \*1. Points to parts of body. (3 or 4.)  
Nose; eyes; mouth; hair.
- \*2. Names familiar objects. (3 of 5.)  
Key; penny; closed knife; watch; pencil.
- \*3. Pictures, enumeration or better. (At least 3 objects in one picture.)  
Dutch home; canoe; post office.
- 4. Gives sex.
- 5. Gives last name.
- \*6. Repeats 6 to 7 syllables. (1 of 3.)
- Al. Repeats 3 digits. (1 of 3. Order correct.)

**YEAR IV. (6 tests, 2 months each)**

- \*1. Compares lines. (3 of 3, or 5 of 6.)
- 2. Discrimination of forms. (Kuhlmann. 7 of 10.)  
Circle; square; triangle.
- \*3. Counts 4 pennies. (No error.)
- \*4. Copies square. (Pencil. 1 of 3.)
- \*5. Comprehension, 1st degree. (2 of 3.) "What must you do—  
When you are sleepy? When you are cold? When you are hungry?"
- 6. Repeats 4 digits. (1 of 3. Order correct.)
- Al. Repeats 12 to 13 syllables. (1 of 3 absolutely correct, or 2 with 1 error each.)

**YEAR V. (6 tests, 2 months each)**

- \*1. Comparison of weights. (2 of 3.)  
3-15; 15-3; 3-15.
- \*2. Colors. (No error.)  
Red; yellow; blue; green.
- \*3. Aesthetic comparison. (No error.)
- 4. Definitions, use or better. (4 of 6.)  
Chair; doll; horse; pencil; fork; table.
- 5. Patience, or divided rectangle. (2 of 3 trials. 1 minute each.)
- \*6. Three commissions. (No error. Order correct.)
- Al. Age.

**YEAR VI. (6 tests, 2 months each)**

- \*1. Right and left. (3 of 3, or 5 of 6.)  
Right hand; left ear; right eye.
- \*2. Mutilated pictures. (3 of 4.)

- \*3. Counts 13 pennies. (1 of 2 trials, without error.)
- \*4. Comprehension, 2d degree. (2 of 3.) "What's the thing to do:  
     "If it is raining when you start to school?  
     "If you find that your house is on fire?  
     "If you are going some place and miss your car?"
- 5. Coins. (3 of 4. Present in order given below.)  
     Nickel; penny; quarter; dime.
- 6. Repeats 16-18 syllables. (1 of 3 absolutely correct, or 2 with 1 error each.)
- Al. Morning or afternoon.

#### YEAR VII. (6 tests, 2 months each)

- \*1. Fingers. (No error.) Right; left; both.
- \*2. Pictures, description or better. (Over half of performance description.)  
     Dutch home; canoe; post office.
- 3. Repeats 5 digits. (1 of 3. Order correct.)
- 4. Ties bow knot. (Model shown. 1 minute. "Single" bow half credit.)
- \*5. Gives differences. (2 of 3.)  
     Fly and butterfly; stone and egg; wood and glass.
- \*6. Copies diamond. (Pen. 2 of 3.)
- Al. 1. Names days of week. (Order correct. 2 of 3 checks correct.)
- Al. 2. Repeats 3 digits backward. (1 of 3.)

#### YEAR VIII. (6 tests, 2 months each)

- 1. Ball and field. (Inferior plan or better.)
- \*2. Counts 20-1. (40 seconds. 1 error allowed.)
- \*3. Comprehension, 3d degree. (2 of 3.) "What's the thing for you to do:  
     "When you have broken something which belongs to someone else?  
     "When you are on your way to school and notice that you are in danger of  
     being tardy?  
     "If a playmate hits you without meaning to do it?"
- \*4. Gives similarities, two things. (2 of 4. "In what way are wood and coal alike?"  
     etc. Any real likeness is plus.)  
     Wood and coal; apple and peach; iron and silver; ship and automobile.
- 5. Definitions superior to use. (2 of 4. "Thing" as genus counts plus.)  
     Balloon; tiger; football; soldier.
- \*6. Vocabulary, 20 words.
- Al. 1. Six coins. (No error.)
- Al. 2. Dictation. ("See the little boy." Easily legible. Pen, 1 minute.)

#### YEAR IX. (6 tests, 2 months each)

- \*1. Date. (Allow error of 3 days in *c*, no error in *a*, *b*, or *d*.)  
     *a*, Day of week; *b*, month; *c*, day of month; *d*, year.
- \*2. Weights. (3, 6, 9, 12, 15. Procedure not illustrated. 2 of 3 correct.)
- 3. Makes change. (2 of 3. No coins, paper, or pencil.) 10-4; 15-12; 15-4.
- \*4. Repeats 4 digits backward. (1 of 3.)
- \*5. Three words. (2 of 3. Oral. 1 sentence or not over 2 co-ordinate clauses.)  
     Boy, river, ball; work, money, men; desert, rivers, lakes.
- 6. Rhymes. (3 rhymes for each word. 1 minute for each part. Illustrate with  
     hat, rat, cat. 2 of 3 correct.)  
     Day; mill; spring.
- Al. 1. Months. (15 seconds and 1 error in naming. 2 checks of 3 correct.)
- Al. 2. Stamps, gives total value. (2d trial if individual values are known.)

#### YEARS X, XI. (6 tests, 2 months each)

- \*1. Vocabulary, 30 words.
- \*2. Absurdities. (4 of 5. Warn. Spontaneous correction allowed.)  
     "A man said: 'I know a road from my house to the city which is down hill  
     all the way to the city and down hill all the way back home.'"  
     "An engineer said that the more cars he had on his train the faster he could go."  
     "Yesterday the police found the body of a girl cut into 18 pieces. They  
     believe that she killed herself."  
     "There was a railroad accident yesterday, but it was not very serious. Only  
     48 people were killed."  
     "A bicycle rider, being thrown from his bicycle in an accident, struck his  
     head against a stone and was instantly killed. They picked him up and  
     carried him to the hospital, and they do not think he will get well again."

3. Designs. (1 correct, 1 half correct. Expose 10 seconds.)
4. Reading and report. (8 memories. 35 seconds and 2 mistakes in reading.)
- \*5. Comprehension, 4th degree. (2 of 3. Question may be repeated.)
  - "What ought you to say when someone asks your opinion about a person you don't know very well?"
  - "What ought you to do before undertaking (beginning) something very important?"
  - "Why should we judge a person more by his actions than by his words?"
- \*6. 60 words. (Score half-minutes separately. Illustrate with clouds, dog, chair, happy.)
  - Al. 1. Repeats 6 digits. (1 of 2. Order correct. Read 1 per second.)
  - Al. 2. Repeats 20-22 syllables. (1 of 3 correct, or 2 with 1 error each.)
  - Al. 3. Form board. (Healy-Fernald Puzzle A. 3 times in 5 minutes.)

#### YEARS XII, XIII. (8 tests, 3 months each)

- \*1. Vocabulary, 40 words.
2. Abstract words. (3 of 5.)
  - Pity; revenge; charity; envy; justice.
3. Ball and field. (Superior plan.)
- \*4. Dissected sentences. (2 of 3. 1 minute each.)
- \*5. Fables. (Score 4, *i. e.*, two correct or the equivalent in half credits.)
  - Hercules and wagoner; maid and eggs; fox and crow; farmer and stork; miller, son, and donkey.
- \*6. Repeats 5 digits backward. (1 of 3. Read 1 per second.)
- \*7. Pictures, interpretation. (3 of 4. "Explain this picture.")
  - Dutch home; canoe; post office; colonial home.
- \*8. Gives similarities, three things. (3 of 5. "In what way are —, —, —, alike?")
  - Snake, cow, sparrow; book, teacher, newspaper; wool, cotton, leather; knife-blade, penny, piece of wire; rose, potato, tree.

#### YEARS XIV, XV. (6 tests, 4 months each)

- \*1. Vocabulary, 50 words.
2. Induction test. (Gets rule by 6th folding. Unfold after each cutting.)
- \*3. President and king. (Power; accession; tenure. 2 of 3.)
- \*4. Problems of fact. (2 of 3. Query on *a* and *b*.)
- \*5. Arithmetical reasoning. (1 minute each. 2 of 3.)
- \*6. Clock. (2 of 3. Error must not exceed 3 or 4 minutes.)
  - 6 : 22; 8 : 10; 2 : 46.
- Al. Repeats 7 digits. (1 of 2. Order correct. Read 1 per second.)

#### YEAR XVI, AVERAGE ADULT. (6 tests, 5 months each)

- \*1. Vocabulary, 65 words.
- \*2. Interpretation of fables. (Score 8.)
3. Difference between abstract words. (3 real contrasts out of 4.)
  - Laziness and idleness; evolution and revolution; poverty and misery; character and reputation.
- \*4. Problem of the enclosed boxes. (3 of 4.)
- \*5. Repeats 6 digits backward. (1 of 3.)
6. Code, writes "Come quickly." (2 errors. 6 minutes. Omission of dot counts half error. Illustrate with "war" and "spy.")
  - Al. 1. Repeats 28 syllables. (1 of 2 absolutely correct.)
  - Al. 2. Comprehension of physical relations. (2 of 3.)
    - Path of cannon ball; weight of fish in water; hitting distant mark.

#### YEAR XVIII, SUPERIOR ADULT. (6 tests, 6 months each)

- \*1. Vocabulary, 75 words.
2. Binet's paper cutting test. Draws, folds, and locates holes.
- \*3. Repeats 8 digits. (1 of 3. Order correct. Read 1 per second.)
- \*4. Repeats thought of passage heard. (1 of 2.)
- \*5. Repeats 7 digits backward. (1 of 3.)
6. Ingenuity test. (2 of 3. 5 minutes each.)

In a somewhat arbitrary but justifiable way the *mental age* of an individual is found by counting each test in the system by the number



of months it represents in the scale and the sum of these months added to the basic mental age (the year in which the subject has passed all the tests successfully) gives the result. Thus a child may pass all tests for a six year old, four for seven years, two for eight years, and one for nine years:

	Years.	Months.
I-V. Credit assumed.....	5	
VI. Six tests at two months each.....	1	
VII. Four tests at two months each.....	.	8
VIII. Two tests at two months each.....	.	4
IX. One test at two months each.....	.	2
	<hr/>	<hr/>
Mental age.....	7	2

Where the tests of later ages are applied, the larger value of the months of the scale after ten years is to be borne in mind and the problem solved in the same manner as above.

As the mental age so determined does not express fully and satisfactorily the intelligence status, the ratio between the mental age and the actual age of the subject is ascertained by dividing the mental age expressed in months by the real age expressed in months. This gives us the *intelligence quotient* (or I. Q.). In determining the intelligence quotient of adults no figure is considered above sixteen years, since that is established at about the period when native intelligence has reached full development. The I. Q. of a man of seventy and a youth of twenty would be exactly the same if the mental age is the same.

**Reading.**—Any defect in the visual apparatus diminishes, according to its seriousness, the possibilities of acquiring the power of reading as well as that of writing. Few, even of the feeble-minded, learn to read correctly with ease, and still fewer can do more than mechanically copy printed letters. It requires, as a rule, less effort to teach a defective to read than it does to teach him to write, as the latter process requires a complicated muscular co-ordination as well as some intelligence.

**General Pathologic Discussion.**—Since idiocy, imbecility, feeble-mindedness are social, clinical groups rather than pathologic groups, there is no essential pathology, but rather a host of different pathologic pictures, as has been outlined in the paragraph on the general etiology and classification. The mental defect is solely the result of a host of different processes; sometimes these are laid down in the germ plasm and are thus termed hereditary or constitutional, again they result from faulty training on an otherwise sound brain. Then again the final picture is reached as a metabolic defect from faulty organs; and chiefly the result is due to traumatic or inflammatory factors producing different types of brain defect or distortion.

The different kinds of defect states cannot be classified on any unitary basis. It is therefore futile to discuss a specific pathology. An idiot may be the outcome of a diffuse encephalitis from mumps or measles, scarlet fever, poliomyelitis, influenza, syphilis, tuberculosis, etc. Even in these instances the type of encephalitis will vary with the exciting factor. Such microscopic pictures will have differing features

and varying trends. Again an hereditary defect may result from two imbeciles who procreate. Here the type of defect will be quite different and will be registered in various anomalies of development. Each and every defective which results from such unions will have its own type of defect, which hardly can be foretold, as the complexities of brain structure are so great. No adequate statement can be made in a summary of this kind which could do justice to the real facts. Thus if a dozen cases of microcephalic idiocy were studied microscopically the pathology in each would vary enormously in a host of small details. Numerous types of fetal encephalitis can result in various degenerations in the nervous system which would cause a microcephaly. Stark<sup>1</sup> pointed this out as early as 1875.

An absorbing and fascinating multiplicity of pathologic processes lie behind these feeble-minded which have resulted from an early destruction of vital sense organs, as in the blind, and deaf and dumb. Lesions of central stations for incoming sensory stimuli, as thalamic loss in fetal life or early childhood from a great variety of etiologic factors, play an important rôle in other types.

One might go on at great length outlining the multiplicity of pathologic lesions which could cause a mentally defective state, but one type of cause should be added, since it has as yet received little attention from students of mental defect states. This is the psychogenic type. There are many mental defectives who have otherwise average brain development who from emotional causes set up powerful resistances to educative processes. They belong in the psychoneurotic group of the classification here outlined. They develop overwhelming fear states which are not understood and hence fall in the group of those of inadequate training as a rule. For a more complete summary of all these situations consult the literature already cited.<sup>2</sup>

**Diagnosis and Prognosis.**—Idiocy is genetic in about two-thirds of the cases, but it is difficult during infancy to diagnose idiocy unless the child be markedly malformed. An extremely small head, closed fontanels, signs of hydrocephalus, and Mongolian characteristics are indicative of idiocy.

If an apparently normal child cannot suck well, has no grasp, lolls the tongue out, and fails to follow light or start at noises, idiocy may be suspected, especially if the family history be poor. Great care, however, must be taken not to mistake a deaf or a backward child for an idiotic one.

It is very difficult to ascertain the acuteness of the child's faculties from the testimony of a parent. They will state that the child understands everything, when in reality he understands only simple phrases

<sup>1</sup> Stark: *Fetale Encephalitis und Amyloid Gehirndegeneration*, *Alleg. Zeit. f. Psychiatrie*, xxxii.

<sup>2</sup> Chiefly Ziehen; Weygandt; A. Marie; Ireland, *Mental Affections of Childhood*; Flatau, *Jacobsohn, Handbuch d. path. Anat. I. Nervensystem*. Bourneville. His many reports from Bicetre, a most illuminating collection. Reports of Massachusetts School for Feeble-minded. Craig Colony Reports of Epileptics. Studies on Agenesis by Hammarberg, 1895. Vogt: Wiesbaden, 1915, etc.

accompanied by gestures. The parents should be questioned as to whether the child could hold his head up, sit up, creep, kick, or walk at ages of average children. While some cases of genetic idiocy are among the most helpless, the greater number of them are capable of improvement, and prognosis is more hopeful than in other forms. In making a diagnosis with the view of prognosticating the possibility of improvement a physician should test carefully the child's power of speech, his knowledge of numbers, his power of attention and his memory, his power of muscular motion, as shown in walking a plank, carrying a glass full of water without spilling, etc.

The lowest types of congenital idiots are incapable of responding to these tests. If their grasp is loose and easily relaxed; if the eyes cannot be caught when there are automatic movements and when the circulation is torpid, as indicated by cold feet and hands, there is not much hope of progress in education and training.

But if the child is strong and active, if he notices and his attention can be held, if he has a firm grasp, and if he has begun to speak a little by six or seven years of age, there is some hope for him.

The full degree of defect can be determined by the intelligence tests already referred to and the causes ascertained by a complete neuropsychiatric examination.<sup>1</sup>

**General Treatment of Mental Defectives.**—The treatment involves the employment of both physician and teacher. It is highly individual. The adjective medicopedagogic is made use of to designate this combination of medical and educational features for the care of the defective classes. In the union of the two professions for such purposes the educator occupies relatively the higher and more important position. The inestimable services of trained caretakers or nurses are not to be overlooked.

That patient will profit most who receives the properly combined aid of the best physician, best teacher, and best nurse. As a rule this fortunate concurrence of necessary aids is more apt to be found in the public or private institution than in the home; but that it is possible to carry on treatment at home under favorable circumstances is not to be gainsaid.

The methods of procedure formulated by Itard, expanded by Seguin, and employed at the present time everywhere in private and public institutions for idiots, modifications induced by experience and the progress of educational science, are well described in the writings of Bourneville, Shuttleworth, Ireland, Down, and others. A brief résumé is given below of the process of—

**Education of Idiots.**—From two years of age the defective or idiotic child may be taught with painstaking care to do what other children learn by observation and imitation. The process of education is in most cases pursued with the following distinct purposes in view:

1. To develop the attention and sharpen the five senses.

<sup>1</sup> See Church and Peterson, *Text-book of Nervous and Mental Diseases*, 9th ed., 1920; Jelliffe and White, *Diseases of the Nervous System*, 4th ed., 1922.



2. To develop co-ordinated movements and strengthen the muscles—(a) To teach to walk; (b) to teach use of the hands.
3. To inculcate habits of cleanliness in person and dress.
4. To teach the patient the use of language.
5. To arouse the intellect by including ideas of length, weight, surface, solids, form, and number.
6. Finally, to carry the education higher by means of studies in natural history and all sorts of manual and industrial and moral training.<sup>1</sup>

<sup>1</sup> Peterson, *Mental Diseases*, 1898. Ziehen, *Die Geisteskrankheiten des Kindersalters*. Jelliffe and White, *Disease of the Nervous System*. Hug Hellmuth, *The Mental Life of the Child*. Weygandt, *Idiotie u. Imbezilität*. Goddard, *Psychology of the Normal and Subnormal*. Healy, *The Individual Delinquent*. White, W. A., *Mental Hygiene of the Child*. Shuttleworth and Potts, *Mentally Deficient Children*, 5th ed., 1922.

# MENTAL PERVERSIONS OF THE SEXUAL INSTINCT<sup>1</sup>

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THE revolting sexual vices and acts that form the subject of the sections on Impotence, Sterility, Rape, etc., are by no means all the crimes that are or that may be essentially sexual in nature. Many atrocious and degenerate acts that on the surface seem devoid of sexual relations in reality have solely a sexual origin. Until this sexual relation was demonstrated, such seemingly motiveless atrocities stood out in the annals of crime unexplained and inexplicable. Observations and studies made during the later decades have clearly defined the causal factors that underlie the crimes done out of lust, perverted sexual feeling, and psychosexual perversion. These factors are essentially mental, and therefore the study of them forms an important chapter of medicolegal psychopathology.

Westphal was among the first of modern alienists to call scientific attention to certain forms of psychosexual perversion, though they had been known from the time of the early Persians, and had made their impress on the Greek and Roman civilizations, as is only too eloquently told by the imperishable monuments of depravity and degeneration preserved in Naples—brazen testimony of iniquitous vices that transforms into material reality the traditions of Sodom and Gomorrah. Many writers have done much to elucidate this subject; Tarnowsky, Moll, Schrenck-Notzing, and Krafft-Ebing have treated it more or less systematically, but to the latter we owe the most thorough consideration of it in its important medicolegal bearings. The subject is an extensive one, requiring for treatment in detail much more space than can be

<sup>1</sup> The extent to which psychosexual perversions have been influential in effect on customs, philosophy, literature, art, and history is fully set forth by John Addington Symonds in two privately printed essays on sexual perversion—*A Problem in Greek Ethics*, 1901; *A Problem in Modern Ethics*, 1896. The latter contains a concluding plea for relaxation or abolition of the English law applicable to criminal aspects of sexual perversion, which, following Krafft-Ebing, he considers "congenital" and "natural" in many cases. The English law Symonds traces back to the edict of Justinian, A. D. 538. In his view, "The problem (sexual inversion) is no subject for legislation. . . . The problem ought to be left to the physician, the moralist, the educator, and finally, to the operation of social opinion."

Without intending to question the sincerity of Walt Whitman's denial of all "morbid inferences," to quote Symonds, "Whitman recognizes among the sacred emotions . . . an intense, jealous, throbbing, sensitive, expectant love of man for man: a love which yearns in absence, droops under the sense of neglect, revives at the return of the beloved; a love that finds honest delight in hand-touch, meeting lips, hours of privacy, close personal contact."

Whitman's feeling is regarded by Symonds as identical with the Greek ethical attitude toward "Pæderastia."

given it here, but fundamental facts and accredited theories can be sufficiently outlined to give a comprehensive view of the subject.

Sex and sexuality lie in something more than mere physical organs of sex: they enter into the very essence of mentality, and mark it as distinctly with sex as the distinguishing organs do the body.

This mental side of sex is commonly spoken of as sexual instinct. The normal sexual instinct is one in harmony with the physical sex and its rôle in the function of procreation. When the manifestations of sexual feeling or inclination deviate from this normal relation the sexual instinct is said to be perverted. The origin and nature of the perversions to which it is subject can be understood only through a clear comprehension of the circumstances and the relations that attend the origin and development of the normal sexual instinct.

The usual correspondence of physical sex and sexual instinct leads at once to the conclusion that anatomic sex and psychic sex constitute two harmonious congenital endowments. But cases in which, instead of this correspondence, there is total lack of harmony between physical sex and sexual instinct, as when a man feels sexually as a woman feels, or vice versa, are not rare, and they have been explained by assuming that in them there is a congenital lack of normal adjustment of physical and mental endowment in the individual; hence arises the class of cases of sexual perversion known as congenital. In other cases the normal harmony, manifested for a time, has given place finally to a change in the mental side of sex, in the nature of inversion of sexual feeling; these are called acquired cases. Obviously, this division of cases into two classes rests upon the assumption of independent but harmonious physical and mental factors operating in embryo to evolve sex and sexuality that are normally in harmony; then the cases in which lack of harmony is manifest from the beginnings of sexual feeling are explained by initial lack of correspondence between the primary factors influential in determining the physical and mental sexual characteristics. Practically the only criteria available for determining whether a given case of sexual perversion is congenital or acquired are facts bearing upon the nature of the earliest manifestations of sexual feeling. When from the first these have been opposed to the anatomic sex, the case is classed as congenital. But facts and evidence of this kind, when derived from testimony based on the memory of the individual concerned, cannot be regarded as constituting more than a tentative foundation for the erection of a scientific theory. As will be seen hereafter, the motives that impel an individual to consider his anomaly congenital are so strong that, with the best of intention, his testimony concerning his early sexual manifestations is apt to be colored in his own favor morally. This will suffice to show the purely theoretic basis of this classification; but it may be further justified by general consideration of the origin and development of sex and sexuality, and we shall be led to make certain modifications of the theory in harmony with practical experience gained in observation of actual cases of sexual perversion.



The human embryo has within it the morphologic representation of both sexes. The subsequent attainment of distinctive organs of one sex is made possible by development of one set of organs, with arrest of development of the other. The cause acting to determine development of one set of organs with arrest of the other is not definitely known, but it seems probable that it is more or less closely connected with nutrition. The well-known effect of quality and quantity of nutriment upon the sexual development of the queen bee is an illustration of this influence. Since the embryo has the anatomic possibility of becoming male or female, it must also normally possess the cerebral possibility of developing a sexual instinct appropriate to male or female. But this does not imply that there are in the embryo the germs of all the various psychic elements which characterize what we recognize as sexuality in its complete development: the facts can be rationally clear only when they are studied in the light of psychology. We must separate the necessary original endowments of instinct from those psychic elements which are the complicated product of original endowment influenced by environment. The sexual instinct is made up of a fundamental element and numerous secondary elements. The fundamental element is general in quality; the secondary elements are special and distinctive of the sex. The simple or fundamental factor in sexuality is nothing more than an impulse to genital stimulation, for the repetition and development of which the quality of pleasure in the act is essential. This fundamental endowment is the only essential original sexual element, and it is common to both sexes. Out of it arise the secondary psychosexual characteristics that, aside from anatomic form, distinguish the sexes and make them mentally, as well as physically, complementary.

In reality this fundamental sexual element is only remotely or secondarily psychic; it is rather reflex in nature, the psychic aspect of it being derived from an experience of spinal reflex activity. It is indeterminate in direction beyond the immediate pleasure experienced in genital stimulation, and, without the opportunity of widened experience or teaching, it would not develop in the individual the secondary psychosexual elements that make up the complete sexual instinct.

Actual experience in the exercise of the sexual function seems of great importance for its normal unfolding; long delay or misdirection of it, aided by imagination fed on ignorance, may be a futile source of psychosexual anomalies, of enduring frigidity. The notable docility of Percheron stallions working in close contact as draught horses is attributable to inexperience, on the one hand, and, perhaps, to careful segregation from natural olfactory sexual stimulation.

Thus far the argument has assumed that the secondary psychosexual elements of the sexual instinct are the result of training and not the expression of an inherent, inherited, and congenitally implanted set of ideas. The justification of this assumption is to be demonstrated most clearly by showing that the series of associated ideas that comprehends what we understand by the normal, complete, and harmonious sexual instinct, is not subject to the laws of transmission and inheritance, and

therefore cannot be congenital. The secondary psychosexual elements are purely psychic: they consist solely of ideas and emotions—viz., knowledge of self as the representative of a sex; knowledge of other representatives of a complementary sex; ideas of the mutual relations of self and the opposite sex; and desire, intensified with pleasurable emotion, to realize these relations with one of the opposite sex. These elements, called secondary, are thus classified because on any hypothesis they must be allowed to be of later development than the instinct to simple genital stimulation. Certainly such elaborate mental pictures as these are not given complete by progenitors to descendants. Ideas *per se* cannot be transmitted or inherited; our so-called mental endowments are, in fact, organic endowments which make possible certain mental developments which we are accustomed to think of inaccurately as mental inheritances. The brain organization which makes possible the ultimate development of ideas is all that is transmitted and inherited in relation to ideation and emotion. How then does the case stand with regard to the congenital implantation of a cerebral organization that shall permit, in the sexual aspect of the mind, only the development of certain ideas with accompaniment of sexual emotion, desire, and genital excitement? To make this possible, there would necessarily be required a distinct and specific sense organ and cerebral centers, and definite paths connecting the higher with the lower genital centers of the spinal cord; or a need to be inherently specifically excitable to a specific stimulus, with necessary reaction in sexual desire and sexual excitement of the genitals. Is there any reason to believe that such organic cerebral organizations exist? In man there is certainly no specific sexual sense organ; and there is, therefore, no reason to assume the existence of any undiscovered cerebral area serving as a cerebrosexual center. Observation shows that sexual desire and excitement are capable of being induced through any or all of the sensory avenues of man, not directly, but indirectly, through secondary ideas of a sexual content; no one of the senses is open to a specific sexual stimulus, exclusively or even predominantly, unless as a result of training or repeated experience.

Thus, the generally accepted notion of a congenital sexual instinct, complete and selective, cannot be entertained without modification. We can understand that the primary element of sexual instinct, the impulse to genital activity, is essentially an inherent fact of organization; but it is indeterminate in objective direction, and for its complete activity requires the guidance of ideas and emotions acquired through experience. Whether experience determines the development of appropriate secondary psychosexual characteristics or not may also depend in part upon congenital peculiarities of cerebral organization, but these need be but remotely connected with the sexual instinct. Thus, for example, the cerebral organization that is delicate and weak is the ready slave of accidental associations of impression and ideas; functional activity readily becomes hyperactivity; stimuli, inadequate for more robust brains, cause too intense and too general activity, and the possibility of

the formation of bizarre and abnormal associations of ideas with peculiar relations to psychic functions is greatly increased beyond normal possibility of like nature.

These we believe are the only ways in which the sexual instinct can be regarded as congenital, and for similar reasons perversions of the sexual instinct cannot be looked upon as more original in their nature. This conclusion is still further supported by evidence of a different kind. In the lower animals there is no more striking fact with regard to sexual activity than the frequency with which it is instinctively perverted in its expression. The dog lends himself to the part of the female quite as readily as he takes his own; the cow, in her period of rut, is given to attempts to enact the part of a bull. Some practices common among human beings are worthy of note as indicative of the weakness of the congenital sexual instinct as far as its objective direction is concerned. In schools and colleges for young ladies, where there is entire absence of opportunity for the society of males, it is not uncommon for a substitute for the latter to be created. Since they are lacking in opportunity to be "courted" by males, those so disposed take upon themselves the parts of males, paying court to certain selected girls. One so selected becomes, perhaps, the object of the affections and attentions of a small coterie, the members of which vie with one another in showering favors upon the object of their love. Such attentions have been known to take the form of costly presents, flowers, and loving letters; and acceptance of them with return of the favor and close intimacy, to be the cause of intense degrees of jealousy finding vent in spiteful conduct on the part of those less successful. Such comedies are not necessarily vicious in fact, but they are in direction; and it is maintained here that they are but the normal result of abnormal circumstances, quite to be expected on the part of girls budding into womanhood who are endowed with normal intensity of what has already been discussed as the primary element of psychosexuality. The known subsequent normal sexual history of girls that have lent themselves to such rôles is sufficient answer to the possible objection that they must have been abnormal.

This aspect of the subject has been discussed at some length to show that the higher psychic elements of the sexual instincts are secondary, not hereditary; that the primary and fundamental element of the sexual instinct, though hereditary, is not determinate in its direction in relation to sex. This is not the place to discuss systems of education, but the advantages of co-education, or of opportunity for cultivation of normal social psychosexual relations, especially for some individuals, are very evident.

We have now to consider the factors influential in shaping the development of the secondary elements of the sexual instinct. The complete sexual instinct involves ideas of sex, and we have, therefore, to trace the origin and development of these. The life of the child from birth to puberty is functionally asexual; but long before he can know the true meaning of sexual feeling or the office of the sexes, he learns to distinguish the latter. Father and mother are known and distin-



guished first—in the beginning by means of the secondary distinguishing anatomic marks of the two sexes; later, with enlarged capabilities and opportunities for observation, by means of the notation of genital distinctions, which, coupled with self-observation, renders self-classification in sex possible. Side by side with these observations of direct relations to sex go others directed to differences of life, occupation, amusements, and dress, that distinguish the sexes. To this is always added the intentional education in the appropriate direction of thought, action, and dress. Thus, long before the significance of sex, as sex, is understood, the child is grounded in knowledge of it in others and self, and in his thought and action represents normally his sex without the conscious activity of an element of true sexual instinct. With the oncoming of puberty feelings and longings are experienced based upon the organic impulse tending to the act of genital stimulation and activity. If sexuality has been explained to the neophyte, his feelings become at once clear to him; if he has been kept in ignorance, his blind instinctive impulse will find some temporary and accidental outlet, usually that of self-abuse, which is finally overcome by proper teaching.

The opportunity for direct observation by youths of the sexes and their mutual sexual relations is much greater among people in primitive conditions, and the possibilities of delayed knowledge and perverting ignorance are very small. Among civilized people the open exhibition, and expression of true sexuality are strictly avoided, and even carefully concealed by misleading explanations given to youths, who thus, unfortunately, are left to the guidance of nature, handicapped into purblindness by the removal of the open chance he has in a primitive state of society. It is then no wonder that certain sexual vices and perversions are the peculiar product of civilized races which make that upon which they depend for existence the object of silence and shame. In this statement it is not forgotten that savages, and even animals, are subject to sexual vices and perversions, but in these instances they have a different origin, as is likewise the case with certain vices and perversions of sexuality met among civilized peoples. The bearing of these considerations upon particular psychosexual anomalies will be made clear when these are described in detail. It may be noted here, however, that certain peculiarities and preferences manifested by a child may be erroneously interpreted as significant of early sexual perversion, when they are really devoid of such meaning. Thus the male child may early show a preference for feminine dress, play, and occupations, but this alone could have no true sexual bearing; it could be nothing more than a preference based on contrasted experiences. Unopposed, such an accidental direction of preference might later, with the attainment of sexual knowledge and sexual maturity, act to pervert the direction of sexual desire and activity. This only emphasizes the importance of proper education in taste for the proper sexual dress, amusement, and occupation as affecting the direction of sexual feeling to be later developed.

This modification of the meaning of congenital as applied to pervers-

sions of the sexual instinct must not be interpreted as overlooking an important distinction made practical by the common classification of sexual perversions into congenital and acquired cases. A perversion arising primarily and early has a potency that is one of the reasons for calling it congenital in nature; for in contrast with a perversion of late and secondary origin, such an early psychosexual anomaly is found to resist all influences exerted to alter it, while the late or acquired anomaly can be more or less readily supplanted by the primary and normal sexual feeling that precedes it in experience and development.

As a further preface to consideration of the psychosexual anomalies in detail, it must be emphasized that observation of them as they occur shows that they are almost always, if not exclusively, functional signs of a general neuropathic state; in many instances they are an accompaniment of neuropsychic degeneracy. And it is rather the rule than otherwise to find such affected persons to be members of families that have most unpromising nervous histories.

Krafft-Ebing has employed a convenient nomenclature for the psychosexual anomalies, which will be followed here.

**Paresthesia sexualis** is a general term covering all the varieties of anomalous sexual feeling, commonly called perversions. The various forms of sexual paresthesia are often associated with other abnormal manifestations of sexual feeling, especially sexual hyperesthesia, less frequently with sexual paradoxia and sexual anesthesia. The latter conditions demand consideration before the details of sexual paresthesia are studied. They are of medicolegal importance because they frequently underlie sexual crimes, and the proof of their influence in such cases necessitates further investigation of the mental condition of the criminals.

**Sexual paradoxia** means sexual activity in individuals who should normally present no sexual manifestations. Sexual excitement before puberty or after age has once extinguished sexual desire is a psychic paradox, and abnormal.

The premature expression of sexual desire in childhood, while frequent, can seldom give occasion for more than medical investigation, owing to its necessary association with moral and legal irresponsibility. But in the case of sexual paradoxia in an old man whose sexual glands have become functionless, it is far otherwise. Such decrepit individuals, dominated by abnormal sexual impulses, frequently become sexual delinquents because of their tendency to seek gratification with children; and all such cases require, in full justice, a thorough mental examination.

Sexual desire may be entirely normal in men of even very advanced years; procreative power may last even to extreme limits of life. To be justly pathologic, manifestations of sexual desire in the aged must present certain peculiarities and have other significant accompaniments. Normally, the psychic aspect of sexuality diminishes in activity with the diminution of the functional activity of the reproductive glands—*i. e.*, desire decreases with loss of virility. But this is not always the case. Sexual desire may outlast virile power; or having once become

extinct, it may light up anew as a result of senile changes affecting the brain. If the intellect of a man thus affected is not too much impaired, he recognizes his physical impotence, while his desire impels him to attempt sexual acts, and at the same time his general moral resistive power is weak. Under such circumstances his most ready victims are children, whom in their ignorance and weakness he can entice, persuade, or force to his uses. Such an individual may be capable of an actual sexual assault, but more frequently the gratification is found in some substitute for coitus. The form of the substitute depends largely upon the degree of mental impairment. The common forms are sexual exhibition and sexual abuse of children; less frequently the anomaly finds expression in the well-defined perversions up to complete inversion of the sexual instinct, leading to sodomy, pederasty, or some indecent and unnatural act. Indecent acts which in themselves can have no sexual significance sometimes give sexual gratification. In such cases the psychologic association is either through the quality of indecency common to such acts and sexual acts, or through the psychologic association of gratification in objective or subjective humiliation with sexual feeling, more thoroughly discussed under Passivism.

Women may manifest sexual paradoxia, but in them it is infrequent and of minor medicolegal importance.

To establish the true nature of senile sexual desire, a consideration of the general state of mind is essential. Such a paradoxical phenomenon may be one of the precursors of a general mental decay that makes its appearance subsequently; but in such a case a careful investigation will usually reveal some slighter signs of intellectual and moral failure, especially the latter, as evidenced by slight changes of character, manners, habits, interests, thoughts, affections, and inclinations, which foreshadow the ultimate profound decay to which senile cerebral changes lead. Irritability, lack of former sympathies, and increased selfishness are all common slight symptoms when they form an alteration from previous characteristics. In a majority of cases of abnormal senile sexual desire the psychic degeneration has so far progressed that there is no difficulty in recognizing the general mental deterioration, which, in removing all former restraining moral influences, allows the sexual inclination to find ready and reckless expression. The recklessness and openness with which old men give vent to their sexual impulses are a fair measure of the degree of dementia into which they have fallen. Sexual excitement in such cases may attain an actually intensified degree and deserve the name of sexual hyperesthesia.

**Sexual anesthesia** signifies absence of sexual feeling. It is normal in early childhood, in old age, and immediately after sexual gratification. Absence of sexual desire is also physiologic when the mind is preoccupied by unrelated thought, study, or any powerful emotion. It is also diminished or absent in some general states of debility, though in others as exhausting it is seemingly intensified; thus no general rule covering this can be formulated.

As a pathologic phenomenon it occurs in a lasting form as an original



anomaly; it may also be acquired. Failure to develop sexual desire, though the genitals are normally developed, is a sign of cerebral defect. This may be the only striking sign of cerebral or mental deficiency, but it is frequently only one of numerous signs of mental deficiency, even to the highest degrees of idiocy. Deficiency of sexual feeling is more common than total absence of it. Women much more frequently present it in its various degrees than men. Its medicolegal importance lies mainly in its relation to impotence and the marriage contract.

The acquired form of sexual anesthesia may result from castration, ovariectomy, disease of the testicles and ovaries, the chronic intoxications (alcohol, opium), and from natural and unnatural excesses in venery. Masturbation is a very frequent cause of sexual anesthesia for normal sexual stimuli, an effect that may be more relative than absolute, sexual gratification being found in abnormal or unusual means of stimulation. Such conditions are a step in the development of complete sexual perversions.

**Sexual hyperesthesia** is abnormal intensity of sexual desire and impulse. It is only when sexual desire is decidedly intensified, prolonged, or too frequently excited that it can be regarded as unequivocally abnormal. In milder degrees it is impossible to distinguish with certainty between health and disease. Sexual desire varies so in individuals and in the sexes that former individual peculiarity must always be the guide in diagnosis. Since woman is normally less passionate and less readily excited than man, when a woman shows unusual intensity of sexual inclination, a suspicion is at once aroused that it is abnormal. Since sexual desire is purely psychic, and in fact an emotional impulsion, it is possible for it, under abnormal conditions, to reach such a compelling degree of force and intensity as to overcome all opposing and inhibitory ideas and feelings, finding expression in the face of circumstances that would normally suppress it.

The power of emotion in general to overcome the ordinary trains and associations of ideas is well known, as in grief, anger, and jealousy; and it is not strange then that sexual hyperesthesia may occasionally be manifested as an isolated mental anomaly, temporarily inhibiting or overcoming all normal opposing ideas. In many cases sexual hyperesthesia is but one sign of a neuropathic constitution, and as a symptom of such an underlying condition it is most prone to reach a greatly intensified degree and thus endanger the individual's responsibility. Neuropathic women are especially apt to be the victims of a pathologic degree of sexual excitement immediately after or in connection with menstruation, a time when sexual desire is normally greatest in women. Such abnormal passion also occurs in neuropathic women at the time of the menopause.

The immediate exciting cause of sexual hyperesthesia may be either peripheral (genitals) or central (cerebral). Local irritation, genital neuroses, and some drugs, like cantharides, may be peripheral causes; central causes are mainly operative in neurotic persons; and pathologically intense sexual desire is frequently an accompaniment of hysteria

and states of general mental exaltation (mania). This state of sexual excitement seeks expression in coitus or in some equivalent for it. Thus it may lead to rape, masturbation, pederasty, or even bestiality. It is the common, though not necessary, factor in cases of sexual perversion, though the commission of a perverse act in pathologic sexual hyperesthesia does not demonstrate that the individual is formally or more than temporarily perverted. Absence of sexual hyperesthesia in one the subject of psychosexual perversion may keep the perversion entirely a thing of thought, never realized in practice. Cases in which there is more or less periodicity in the manifestation of sexual excitement are instances of a true neurosis or of periodic insanity.

It may be mentioned in passing that sexual hyperesthesia in the husband or wife, with secondary consequences, may become good ground for divorce.

The general term **sexual paresthesia** covers all possible forms of perversion of sexual feeling and sexual activity. Sexual desire or instinct is said to be perverted when it is directed outside of the limits within which it is capable of serving its natural purpose. When a perversion is associated with sexual hyperesthesia, the perverse direction of desire finds fulfilment in acts. The nature of the acts possible under such circumstances, extending from mere sexual indecency to brutal murder, renders this class of psychosexual anomalies of paramount medicolegal interest. A distinction is to be made, if possible, between vice and disease as the causes of these psychosexual anomalies. But a pathologic psychosexual state, existing whether as a result of vice or as the result of conditions for which the sufferer is in no way responsible, should not change the light by which it is viewed in the tribunal of justice. Vicious practices are, as we shall see, potent causes of sexual perversion, but long before they have given rise to a pathologic state in a strict sense they may lead to criminal acts. The fact of vice alone, or of any act arising out of it, is not enough to establish the diagnosis of pathologic perversion any more than the existence of a hallucination or a delusion can be the basis of the diagnosis of insanity. In such cases, besides the proof of the existence of vice as a contributing cause of a perverse sexual crime, it is also necessary to demonstrate other signs and symptoms that point directly to the existence of a true pathologic state as an underlying cause. Examination of the physical, nervous, and mental condition; consideration of the history of the individual and his family, and inquiry into his education, training, and all the influences that have molded his character or formed his habits are the means upon which we must rely for information that will enable us to give a correct opinion of the nature of such a case.

The normal object of sexual desire is the opposite sex; but the sexual impulse may be so changed or so completely misdirected that the same sex becomes the chief or sole object of sexual inclination. This complete reversal or inversion of normal relations was called *contrary sexual feeling* by Westphal, but it may be conveniently and briefly designated by the words *sexual inversion*. It is the most strikingly

abnormal sexual perversion, and for this reason, as well as for the reason that those subject to it may at the same time present other forms of psychosexual anomalies, it is here discussed first.

The first part of this article discusses the congenital and acquired elements that constitute the normal sexual instinct, and shows how the beginnings of sexual desire have no objective relation to sex, but that the ultimate directing ideas are the result of imitation, teaching, and experience. It may be added that many observers, especially Krafft-Ebing, Moll, and Schrenck-Notzing, look upon the existence of a neuropathic constitution, original or acquired, as an almost essential prerequisite for the manifestation of sexual inversion. This conclusion is based upon study of actual cases, which, it must be allowed, show this association of conditions; but some observers contend (Raffalovich) that sexual inversion is possible without other sign or symptom of degeneration or mental disequilibrium, and the possibility must be admitted on both theoretic and empiric grounds. From a medicolegal standpoint, however, the fact of the usual association of sexual inversion and neuropathic and psychopathic conditions or tendencies is of prime importance.

Sexual inversion is met with in varying degrees, from mild predilection for the same sex, associated with normal inclinations, to complete inversion with horror of the opposite sex in sexual relations. The sexual rôle of the affected individual is also subject to inversion. Thus, the male, even when abhorrent of women, may still retain the normal active rôle; or he may find his sexual gratification only as the passive party in the sexual act. The same reversals may be observed also in females. The inversion frequently extends beyond the strictly sexual feelings to the secondary attributes of the sexes. The homosexual man may ape the manner, dress, speech, acts, habits, and occupations of the opposite sex; the homosexual woman may assume all the secondary characteristics of masculinity. The extent to which this aspect of the inversion is manifest depends upon the sexual rôle of the individual. In some cases there is a noticeable approximation of the individual to the opposite sex in general form and secondary anatomic characteristics of sex, aside from the genitals. Such cases lend color to the congenital theory of the origin of the anomaly; but it is a fact beyond dispute that persons resembling the opposite sex in general physical make-up are by no means necessarily subject to a corresponding psychosexual inversion.

The possible acts of a criminal character to which sexual inversion tends are numerous. Masturbation, passive or mutual, is a favorite manner of sexual indulgence, which may become criminal when it is practised with children; coitus is imitated *inter femora*; active pederasty is performed but seldom, and then in obedience to intense sexual desire; passive pederasty may be submitted to in order to please the active party, or as a realization of the desired passive feminine rôle. The homosexual female is given to similar equivalents—mutual masturbation, cunnilingus, imitation of coitus when possible; but they can have only a minor medicolegal bearing from a criminal standpoint,



aside from the possible seduction of female children. Legal questions may arise in cases where two persons of the same sex become allied and live in an association which shocks public morality or contravenes the rights of others. Thus one woman might become so infatuated with another as to submit herself and her property to the dictation of the object of her affection, to the detriment or obliteration of family ties and rights of property. Domination of one of two persons thus abnormally associated is the rule, and the subjection of the passive party is usually extreme—a condition fertile in raising legal questions, aside from formal criminal acts.

As illustrations of sexual inversion the following cases are chosen, with a view to present its various types. It will be noted that they also illustrate other forms of perversions of the sexual instinct, more striking examples of which are offered in the subsequent discussion of them in relation to criminal acts:

C., the subject of the following history, it will be seen is not subject to complete inversion, but is capable of heterosexual intercourse in spite of homosexual inclinations.

Under date of April 14, 1894 he gave the writer the following résumé of his life and symptoms:

"I shall try to give you as compact and complete a history of my case as possible. A New Englander born, both my parents were of nervous temperament. Mother was always delicate, and died of consumption in her thirty-first year. All her relatives were delicate and nervous. At my birth in 1869 I was very weakly and my life was barely preserved. Without teaching, I began to masturbate at the age of eight or nine. All my early associations were with boys; as far back as I can remember I have always preferred being with persons of the opposite sex. Still I cannot decide whether to call my condition congenital or acquired. I did not learn the terrible results of masturbation until my sixteenth year, never realizing what I was doing until that time. So great is the veil of blindness that this curse throws about one, and so retiring and sensitive does one become, that the chance of learning the true state of the matter becomes very meager. From that time until I was twenty-one it was an everlasting struggle between my better nature and the curse of which I was the victim. I tried everything, including natural sexual intercourse, and succeeded in a measure in stopping the vice, but not entirely. You can imagine what the effect of this habit on my weak constitution was. Above all, my mind was in a terrible condition, and my digestive organs were seriously deranged. During this period contrary sexual feelings were very strong. It is a great humiliation to describe them to another for the first time. Between my sixteenth and my nineteenth year I became enamored of several young men, one in particular, with whom I went to live in B—. For two years we were employed in the same place of business. We lived together more than a year, but never practised masturbation together. We roomed together. My desire was merely for bodily contact and embrace with him. My feelings for this young man were intense; I simply adored him, and thoughts of him, then and ever since, and even now, drive me nearly wild. In my association with him I experienced no relief or improvement of my general health; of course I felt great pleasure in being near the object of my love, but I had so many emissions that life became a burden from headache and general depression of vitality, quite as bad as when masturbation had been practised excessively. At last this condition reached a climax, and I tore myself from home and friends. I left four years ago, going south for complete rest and change and avoidance of sexual excitement."

After telling of his improved health under the change he continues:

"Many times I was near suicide. Even now there are days when I am controlled by the most outrageous ideas, and I am forced to fight with myself to keep from doing something unnatural or desperate. My relatives know nothing of my actual condition, but attribute my desire to be away from them to eccentric notions. I have

always had a great desire to do something to excite a public commotion or sensation, and several times I have been on the point of doing very rash things in order to satisfy my unnatural longing. I conceived the idea of going to New Orleans and robbing the principal banks of that city. I actually went there and remained two months perfecting my plans for that purpose; but before my plans were completed my mind was led off to other things. Later I prepared to go to Europe to 'do up' some of the crowned heads, and I had my plans all laid which would require three years to mature; but something else arose to distract my attention. Even now I am frequently almost carried away with the desire to do something unnatural or crooked, just to have people say I am smart. At other times I am disgusted with myself for entertaining such ideas. I am greatly troubled with philanthropic notions. Were I to become possessed of money, I should probably put some one of my impractical ideas into immediate execution. I have ceased to masturbate, except at times when I am overcome by passion. Lately I have practised regular sexual intercourse. In this I am troubled with premature ejaculation. If I could but have normal coitus, I think I should be able to overcome my contrary sexual inclinations, and perhaps develop some liking for the opposite sex. My liking for males is very strong yet, and I cannot sufficiently control my mind to keep men out of my thoughts. I think this unnatural desire must be the most intense possible to a human being. Did it not lead to such disastrous conditions of mind and body, I should prefer it to its opposite. I think the great trouble with me now is an excessive general debility and mental weakness which render me unable to resist my unnatural desires. Do not think from anything I have written that my unnatural sexual feeling is weakened; it is just as strong as ever, but I am making great effort to overcome it."

This case is one of the milder degrees of sexual inversion, probably acquired as a result of masturbation. Its conjunction with a neuro-pathic constitution, probably inherited, is noteworthy. The predominance of insistent and imperative ideas is instructive, as showing the psychologic origin of possible non-sexual crimes; while the possibility of his perpetration of formal sexual crimes is for the same reason increased.

The next case illustrates a condition of active homosexuality more complete in degree, likewise associated with a deep neurotic taint.

"My father was, so far as I know, normal in his sexual feeling, a passionate man, and unfaithful to his wife. After my birth he became addicted to the excessive use of alcohol, and in the attempt to check the desire for stimulants formed the morphin habit. This in turn he overcame only to become insane (acute melancholia), and then resorted to chloral to overcome insomnia, and finally ended his own life by shooting himself. He had two brothers who became insane, and I believe one, if not both of them, committed suicide. My mother was of a nervous temperament, and died of paresis complicated with some spinal trouble. I have a brother, normal but passionate in sexual feeling, and a sister of marked heterosexual feeling, but with masculine tastes—fondness for stimulants and smoking and masculine diversions.

"I myself am thirty-six years old, five feet eleven in height, of slender build, a teacher by profession, and of an emotional and nervous temperament. I measure twenty inches around the waist, and thirty-six around the hips, but this is the only feature suggesting the feminine type, as I have plenty of pubic hair, also a heavy dark beard, and much hair on my breast; a masculine baritone voice, and normal pectoral development. I have never cared for stimulants or tobacco, hunting, or violent athletics, but have found my diversion in drawing, painting, music, and photography. I have no inclination for feminine amusements or dress or effeminate indulgence of any kind. The first sexual excitement occurred some time before puberty, and was caused, as I remember it, by the irritation of an elongated and tight prepuce, which induced the habit of masturbation without instruction or any understanding of the true significance or purpose of sexual feeling. During such excitement my mind pictured myself with other boys dressed in fanciful costumes, tights, etc., riding in a circus. There seems to have been

nothing to connect sexual feeling especially with men, certainly no instruction or personal experience, which would have given a false impulse from the start. And I am absolutely certain that from the very first sexual feeling to the present day I have never felt the slightest feeling of love for a woman, and no woman has ever had the slightest sexual attraction for me. Beyond this I cannot say whether or not my homosexual feeling is due to heredity or a false education. As a boy I often thought that it would be interesting as an experience to associate sexually with women, and I felt then, as I do today, that such association might be pleasurable and successful; for I have never supposed myself impotent, but the attraction has never been sufficient to impel me to make the attempt, and I have never felt the need of any such normal satisfaction. When I was sent away to school at eleven years, I soon had sufficient instruction in sexual matters, and continued the habit of masturbation almost daily with an occasional week or two of intermission during an unsuccessful effort to stop the habit. While in school sometimes physical contact with other boys would produce sexual excitement; but never then or at any time since did I indulge either in mutual onanism, pederasty, coitus *inter femora*, *in os*, or in any other form of abnormal relation with other boys or men. While in school I fell in love with a handsome youth older than I, and this was my first experience of the emotion. I remember trying in every way to please him, and I was unhappy when away from him. I had the same experience with another fellow during my school life, but I was utterly ignorant of the sexual nature of my feeling, and they made no unnatural advance to me. When I entered college I again fell in love with a handsome young man with whom I was intimate, and when sleeping with him he was very affectionate, taking me in his arms, and then I was conscious of strong sexual excitement, but without emission or any vicious attempt on his part. Since then a number of men have attracted me sexually, and I have felt for some of them the strongest kind of passionate love; and while I have had every opportunity to satisfy myself with them, I have never done it in any way, being restrained partly from self-respect, fear of injuring them, and also fear of exposure. With one exception our intercourse has been confined to mutual caresses and contact while in bed or asleep. Pederasty I have never desired, and the thing seems repugnant to me. The natural way would be coitus *inter femora*, if I followed my desire. Once on contact of my penis with the penis of my friend in bed a violent orgasm followed, but this was not anticipated or intended, and never repeated. I have never been seriously ill, but have suffered from puberty with sick headaches (hemierania), which always begin with half-blindness, generally on the right side, which is followed by violent headache, and nausea and vomiting which has seldom been stopped except by hypodermics of morphin administered always by a competent physician. These headaches were and are very prostrating, and are preceded and followed by acute nervous depression and exhaustion. I have not been free from nervous dyspepsia for years, and this fact has made it hard for me to take strong medicines, as they always upset my stomach. The use of bromids in 30-grain doses has generally made me ill after a while. The bromid was used without medical advice in the attempt to quiet sexual restlessness, but never was very satisfactory. For many years I have had a chronic irritation of the anus, and two years ago was operated on for the cure of both a fistula and fissure. These must have existed for some time, and have been a source of irritation to the prostatic urethra, as I had good reason to think later. I never go to sleep now without the use of an ointment of bismuth to quiet the irritation. A year ago I came to the conclusion, after some medical reading, that an elongated prepuce might be the source of urethral irritation, as it annoyed me sometimes in walking. The prepuce covered the penis when in a flaccid condition, and gathered over the meatus in a little bunch. Thus the gland was kept moist and sensitive. I consulted Dr. B., of New York, who at once advised circumcision, and said that he could have saved me much in every way if he had had the care of me years before. The circumcision was a decided relief, and since its performance I have been without any of the old annoyance and partial erection when walking. On examination, he found a congested state of the prostatic urethra and treated it several times with stimulants by injection, but I had to leave the city before he felt the difficulty had been remedied. At present there is a congested condition in the same place, and recent attempts to remove it by electricity have proved useless. The congestion is not very severe, and manifests itself only by irritation and an occasional feeling of burning and a sense of congestion. The use of a sound has been quieting, but only a small sound can be made to pass into the prostatic urethra.

"Of course, with homosexual feeling, I have had the usual perverted instincts—fondness for male characters on the stage, male statues, pictures of athletes,



etc. Masturbation has been continued at intervals up to the present time, and is overcome only for a week or two at the most. I never handle myself, but after an interval of continence the impulse amounts to acute irritation of the whole sexual system, and it seems impossible to keep sexual images out of my mind, and often before I know it or realize my condition, the orgasm takes place by the slightest instinctive movement of the body, and the mischief is done. I feel certain that with normal and healthy conditions I could never allow this to occur; I mean unless there were some actual congestion or unnatural crethism which might possibly be overcome with medicine or surgically. As to sexual dreams, they have occurred rarely, and when they do occur, they concern men and not women. If I do not masturbate, nocturnal emissions do not seem to be abnormally frequent. In fact, I think I would be better if they did occur oftener. I am strong sexually, that is, I have vigorous erections mornings, and at other times strong passionate feeling, and naturally I am energetic and restless. My dreams never have concerned women, so far as I can recall them, but generally suggest physical contact with boys or men in a nude state, which quickly ends in an imperfect orgasm before the dream comes to any crisis, and then I wake. I am not at all strong, and I am subject to depression and weariness of life; I am badly nourished, owing to this dyspeptic habit (hyperacidity), and restless at night, not infrequently suffering from wakefulness for six or eight nights at a time. I imagine that if I were to attempt intercourse of any kind, the emission would be premature. I have never had or attempted intercourse with either man or woman, normal or abnormal. I think this is partially due to the fact that a gross man never interests me; that is, one who would be inclined to make advances to me. For, strange as it may seem, the feeling of love has been much stronger than the lustful desire, and has led me to associate with men of my own type of education and habitual feeling, who were, so far as I know, in every case perfectly normal, though in every case they have returned my love, as was evident from their caresses, attentions, and responses to my advances to them. I cannot remember the time when I was not thus interested in some one friend, whom I believe I have loved as truly as ever a man loved a woman in a good sense; and so far as I could see, the love was not only legitimate enough, but a comfort and inspiration to me, and, as men have told me in several cases, a saving moral influence with them. The thing has been just as natural to me from the start as heterosexual love is to most men, and I never really appreciated its sexual character until I read *Psychopathia Sexualis*, which opened my eyes and actually made me sick—physically ill, as well as mentally despondent. I felt that I was degraded and in unspeakably degraded company. But still I feel that taking it altogether, this love, abnormal as it is, has been the very best and happiest part of my life so far as it has been inspired by individual friends. Had it led me to habitual sin, perhaps I should feel differently about it. Years ago I used occasionally to wonder why I did not fall in love with girls, as most boys do; but I thought that it would come some day, and all the stronger for the delay, and consoled myself that I was naturally more affectionate with men than other men were, and so would have more friends. I don't think that any one of these friends knows that there is anything abnormal in my feeling toward them. Everything that a refined and careful education and bringing up could do to make grossness abhorrent to me was done, and I must confess that the full satisfaction of my homosexual love does not seem either as unnatural or as vicious as it should. I am perfectly certain I should be the better and happier for it, and it has been only by a superhuman effort that I have kept myself from it; an effort which has almost made me physically ill at times. I should have said that I have no impulse to assume anything but the active or masculine rôle in relations to men; passive pederasty would be repulsive to me, as also would be the active form, unless I were strongly tempted. I think there has been no trace of effemination, as I understand the expression, in my make-up, apart from what I have mentioned. Most of the time I am hopeless and indifferent, but occasionally I have a moment of profound chagrin and anxiety, with acute self-contempt; but this feeling does not last, because, as I have said, this love is so much a part of my life and is so free from any positive sexual indulgence with others that for the most part it seems like a pure and comforting gift. Of course, I know that this must sound like maudlin, arrant nonsense to a normally constituted man, but such a man is incapable of appreciating the fact that in a case like mine the love of which I speak is the only love which the man can know, ever has known, or ever can know, and it seems to him neither degraded nor criminal, and as a simple matter of fact does not necessarily lead to either crime or abuse, though of course some form of sexual indulgence would be its only perfect satisfaction. I suppose this is proved or illustrated by the account of the Greek 'Pedophily' in *Suggestive Therapeutics* which

I have just read. Now as to masturbation in any form, that is bad, demoralizing, and enervating, and must be stopped at any cost. I also could be glad to give up any inclination toward homosexual love, chiefly because I fear that under some circumstances I might become criminally culpable, and because at best such feeling, without its natural satisfaction, is often a source of torture as well as pleasurable social intimacy. I do not desire coitus in marriage, because as yet I do not care to support a family on my present income, *but more than all else* because I have felt for years that there is undoubtedly a hereditary taint in my blood; and *I should consider myself little better than a criminal if I reproduced either my father's disposition or my own in the life of a child.* We, as a family, are a degenerate lot, and it is better that the name and nature should die out as soon as possible. If I had children of my own, I believe that anxiety about them would make me insane, if nothing else would. The only thing I can hope for is a reasonable habit of self-control and the eradication of abnormal impulses and feeling. Some day I shall lose my mind if this cannot be accomplished, and I should prefer extreme measures (some form of surgical interference), if other things fail, rather than to go on as in the past.

"If a man through hereditary taint has no right to beget children and transmit the taint, why is not castration, for example, justifiable where abnormal instinct is pronounced and the man is only a torture to himself and little good to society?"

From a long acquaintance with this case, the writer would still further emphasize the serious neurotic constitution of this unfortunate man. The perfect normality of his mental condition is instructive in its relation to his grave psychosexual anomaly, and in the bearing of the latter upon moral responsibility. Nevertheless, a person so neurotic and withal so morally sensitive might under strain become guilty of criminal acts for which he would be justly irresponsible; but the irresponsibility would be related immediately to the mental state at the time of the commission of the crime, and but remotely to the psychosexual anomaly. His moral sensibility might lead to concealment of the underlying motive.

The next case is an illustration of psychosexual inversion, with a bad ancestral history. It is of early development, and there are indications of effemination or an approximation to the general psychic characteristics of the female, though socially, as in the society of women, there is an absence of it. Mr. G. is thoroughly masculine in physical make-up, and entitled to the distinction of being far above the average man in culture and intelligence.

"I was born on September 22, 1866. My mother's family was of good sturdy stock. My father's family are distinctly nervous people. My grandfather, on his side, was half crazy the last years of his life. One of my father's sisters committed suicide. Two others are now poor nervous women. My father's oldest brother is so eccentric now as to warrant the term 'half crazy,' and my cousin (his son) died in an asylum after being four years at college. I am exactly like my father. He is nervous and shows signs of having some trouble just like his brother, only in a much milder form. He is certainly the best one in the family. I started into school early, graduating from the Grammar School at the age of twelve, being the youngest fellow who ever received a diploma. I should say my life began sexually in my eleventh year. I note a distinct difference between inherited 'homosexuality' and acquired, and much importance seems to be attached thereto. The question is difficult to answer, because of the dim perspective of the long intervening years. Still I am strongly convinced that it is inherited. Certainly my earliest remembrances sexually were thoughts of boys, and I have a sharp recollection of being strongly influenced by a young schoolmate—it seems almost before my life began sexually, certainly in the first six months. I left the Grammar School when I was twelve years and six months old, and at that time I know I had the most intense passion for two fellows, one right after the other. The two must have lasted a year. I attended the High School from '80 to '84. During this period I worked out of



school mornings running a milk-route, and afternoons did a great deal of extra work preparing for college. During this period I was influenced by three fellows, the last one of whom excited the strongest passion and absorbed my capacity for studying. This fellow wore me out nervously. I became fairly absorbed in him, went to see him all the time, with eager look and palpitating heart. During all this period I was very popular with the girls, ran dances, whist parties, etc., and was a leader in everything social. I have had a couple of slight spasmodic sexual attractions for girls, but only in a faint way. I recollect also sudden flamings caused by fellows, lasting only a month or so, and ending as suddenly as commenced. Masturbation set in at eleven years, and lasted longer than is usual. In 1884 I entered college. Here I lived through the first of my two fearful experiences. A college friend, T., held my life spellbound for four years. We were inseparable, and during that time I made intense drafts on my nervous system. Not one single thought crossed my mind that was not first considered with reference to him. During the last year he grew wild, drank a great deal, and as I refused to follow him, we grew apart. This period ruined my health. I could not sleep. I suffered intensely, lived more in a day than I had ever done before. I pined away, wore my nerves entirely out, grew morbid, suffered intensely from melancholia, which I could not drive away. I added much by drinking a great deal. I ended a total wreck in June, 1888. My career in college was a steady wearing out of my vitality. I lived severely in the excitement of athletics, bet a good deal, and lost a lot, and wasted my energy with imprudent prodigality. That fall, the loss of T. (as I did not return to college) wore so hard that in December, under a fast appearing cloud of insanity, intense morbidness, and total inability to muster facts properly, I gave up entirely and consulted Dr. X., but told him nothing of my perverted sense. At his advice I went south for three weeks, and returned immensely improved. I went to work, and under its monotony grew better. I was still under the influence of T., whom I saw about once a week, when suddenly P. appeared, a fellow who lived near me, and I started again, completely infatuated, and from which infatuation I am still unable to free myself today. This began in December, 1889. From '90 to '91 and '92 we were inseparable, and I lived on, my nerves gradually wearing out. In the last of '92 P. showed signs of liking a girl, and then I ran down with lightning rapidity. I grew morbid, jealous, almost insane. I could not sleep. I have taken a revolver in my hands a score of times, but each time thoughts of my family stayed my hand. This man found me out. Then I consulted a doctor in B. and received no sign of encouragement. He knew nothing of sexual perversion and threw me off the scent. I waited a while and then consulted Dr. X. again. He was my first ray of hope. He knew something of these cases, gave me some 'hydrolene' and a preparation with iron in it, and said I'd soon be over it. He was unsatisfactory, treated the matter lightly, and seemed to think it was nothing. I kept the 'hydrolene' up for a year or more, and then, as I grew very stout, dropped it. It certainly had a very good effect. I returned home, told P. the whole story, and asked his help, depending upon his long-tried faithfulness. He made a few attempts to see me, but soon gave me up almost completely. He refused to talk with me on the subject, refused to say what his relations with me were to be, and by his coolness and perversity of spirit did more to harm me than anything else. I passed a year of fearful mental anguish, being within a few doors of him, seeing him just enough to render me almost crazy, hoping night after night that he would call, walking by his house, tossing for hours in bed, living only to see him. Here my business gave way under the depression of the times (my father had bought me a business in 1891), and for a year I went through an awful wrench of financial worry and woe, ending in October, 1893, in complete failure and utter ruin. It was an awful year, but, strange as it may seem, it was the social side that was the worst. I actually looked on my financial troubles as things to take my mind away from my love of this friend P. The last year, October, '94, has been spent in an endeavor to gather up all the scraps that are left. Since April 1st I have gained, but very slowly. P. has married and moved away. I am still strongly under his influence. I mourn his loss. I have few friends, and I cannot get interested in the other people around me. The cowardly desertion of P. and his coolness are still wearing me out, and, try as hard as I will, I cannot regain control of myself. I went into business on August 1st, get but a small salary, but have a most excellent chance to get ahead.

"You ask for a description of myself. I am short and stout, 5 feet 7½ inches tall, and weigh 156 pounds. I have thick black hair, thick-set shoulders, stout body, and a tendency toward stout legs. I have had considerable gymnasium training, but my nervous trouble prevents me from being strong. My testicles are probably smaller than the average. I am hopeful to a great extent, extremely



anxious to conciliate all to whom I talk, am considered very funny by my friends, train a great deal. I like a joke, and see the humorous side of life very strongly. In life, both socially and in a business way, I am living entirely on my reputation gained before I was twenty-two. I am now completely out as far as my brain is concerned. It can stand no strain. I cannot use it with any regularity. I cannot depend on it. I grow confused easily. What I want now is instruction how to seize the really fine opportunity I have in business by regaining my health and gathering up what threads I can get after the last ten or twelve years of intense strain on my head. My brain is rattled, and badly so. I have lost the capacity of long and steady thinking. I must make a success in business now. If I lose again, I believe I shall be lost forever. I want iron—an iron hand, an iron will, a steel heart. I want to learn how to rid myself of the relapses that come with fatal insistence. I want all my days to be good days, for I do have some good days now. I dream too much. I find myself in trances. In business I seem to be asleep—many things get by me. How can I rouse my old-time energy? When can I learn how to gain an enthusiastic interest in my business? I have no desire to live were it not for my family. I would gladly close my life tonight. I believe I have no hope, no desire socially. I only want to retrieve my fallen star in the business world. Once my day's work ceases, I am lost. Shall I resort to intercourse with women? I have never done this, partly from lack of desire, partly from strict Puritan inherited tendencies. I am not entirely devoid of love for them, but it is very faint. Now I am afraid my nervousness would prevent coitus should I attempt such an experiment.

"There is a young lady here whom I like the best of any girl I ever knew, but also platonically. I haven't the slightest sexual feeling for her. We go together some, are both of us deeply interested in books and mental work, but I can go for weeks without seeing her, and the lack never affects me. Ought I to marry? Would I hate it all if I should? Could anything be done to make me love sexually the other sex? Socially, my life is sad. I have few friends now. I find they have all grown away from me.

"Lastly and strongly, I want to learn how to stand face to face with a man and talk to him. I have a certain cringing, a fear of myself, a confusion, a dread of meeting any one. I feel as though it must be the feeling of a young girl meeting a hard, sharp man of forty, who treats her brusquely. Today, yesterday, every day, this cringing, cowardly, sneaking fear is ruining my business chances. I thought it was due to the disease. I hope to God it is, but I am afraid now it is due to my slight effeminacy or to an inherited fear which I think I see in both my father and mother. It is awful to my spirit. It can't be killed. I hope it may not live long. Lastly, I have no hope to live for, unless I can get married; already all my friends are moving away, and soon I shall be alone. *Tædium vitæ* is a fearful curse to me now. I have a slight tendency to effeminacy; this I combat by smoking and drinking, so that I have the name of a 'good sport' among the fellows. Both vices are injurious to me, but I think I gain a certain contentment and a more manly tone from them."

The following case is a very remarkable one, as an example of more complete inversion, with a decided transformation to the general rôle of the female in thought and desire, and with some indications of anatomic effemination. The fact of normal marriage, in the face of practical psychic impotence, is noteworthy. The history is given in detail, because of its interesting psychologic details, and its refutation of the assumption that a psychosexual anomaly is always coupled with psychopathy or neuropathy.

"I am now thirty-three years old; 5 feet 9 inches tall; somewhat bald; my beard is quite strong and rather hard; my hips are quite wide, so that they are often noticed by strangers; my shoulders are sloping and shaped like a woman's. My arms and legs also have a feminine appearance. I have very well-developed mammae, but my genitals are of normal shape, as far as I am aware. I have a good growth of hair about the axillæ and genitals, but otherwise the hair of my body is scanty. The gait is entirely feminine; the voice a tenor and not unpleasing; the muscular development is quite weak; there is considerable adipose tissue.

"I am not aware of any hereditary taint, except that my maternal grandfather committed suicide in a time of financial embarrassment. My father is

said to have been of passionate character, and to have given my mother ground for jealousy. I have always been of good health, and never had even the usual children's diseases, except a slight attack of measles in my eighth year. From early boyhood I was averse to the rougher games of my comrades. I never could fight, and was often bullied by stronger boys. I liked to play with girls and enter into their games with dolls and household utensils. I also liked to be occupied with housework, like sweeping and dusting. This inclination I retain to the present day. When I was a young boy my mother often had me set the table when guests were present, and wait upon them, which I enjoyed greatly. I also often arranged bouquets and flower garlands, which gave and still gives me great pleasure. I should have liked to be taught to sew and embroider, but was ashamed to ask for it.

"If my memory serves me rightly, I first had erection in my thirteenth year. I was utterly ignorant of the significance of this occurrence, and was greatly disturbed by it because I believed it to be a disease. About this time I had for the first time a masochistic idea. It struck me how pleasant it would be if I could kiss my (male) teacher's feet. From this time on my sexual development was very slow. My voice changed in my seventeenth year. About the same time I first had an ejaculation, but I do not remember what occasioned it. My notions of sexual relations were of the haziest kind. Up to the seventeenth year I thought that women had a penis like men. At nineteen I believed that the navel was in some way connected with the act of procreation. Not till I was in my twenty-first year did I get a clear idea of the nature of coitus by means of a medical work. In the mean time I had discovered as early as my fifteenth year that it gave me peculiar pleasure to embrace and kiss my boy friends, and still more to be kissed by them. Beyond this my desire did not go for a long time. A great deal earlier than this some boys tried to grasp my genitals, but I never allowed them to do so, and even used to run away when they attempted it. At this time I was very modest and disliked exceedingly to undress in the presence of other boys. I think that I should have been much less embarrassed in the presence of girls. In my friendships, as long back as I can recollect, I always delighted in being very submissive to my friend, so that all the boys of my acquaintance came to understand that I would always obey every word of my intimate. At the same time I was quite independent, and even sometimes overbearing toward those with whom I was not on close terms. At fifteen I fell enthusiastically in love with a very handsome and amiable boy about a year older. This was as pure and ideal a sentiment as the first love of any maiden. My feeling toward him was entirely like that of a woman toward a man, as I know now, although then I was not conscious of this. My friend did not know the peculiarity of my feeling, but treated me in a frank and affectionate manner, as he would any other friend. I would have given almost anything for a kiss from his lips, but I never received it; he never thought of such a thing, and I was too modest to kiss him. I wanted to be wooed, not to woo. With others of my friends I was less shy. About a year after I had become separated from my first love I found a boy of my own age whose kisses I enjoyed exceedingly. I was then in my eighteenth year. He was the first whom I allowed to handle my genitals, and whose penis I took in my hand at his request. But I felt no pleasure in doing so, and only did it because I was accustomed to obey him. I should have preferred if he had confined himself to kissing. To this boy I expressed a wish to be a girl. He asked the reason, and I knew no answer except, 'Then I could love you more.' This wish to be a girl began to arise frequently in my mind about this period. At the same time I began to fancy myself as a woman in various situations with my boy friends, preferably in the rôle of captive or slave. These imaginary adventures always induced erections and often ejaculations. At the same time, I never felt sexually excited in the presence of females, but I liked to be in their company, provided they would treat me like one of them. I did not like to go to balls and similar functions where I had to act the part of a man toward young ladies, and I never learned to dance. About this time I discovered that I was considered a handsome boy, and was delighted with it. I tried on every opportunity to hear praises of my personal appearance. At the same time, I found that people thought I looked a good deal like a girl, and this pleased me even more. My comrades often teased me about this, telling me I ought to put on girl's dresses or asking whether I was not a girl in disguise. This pleased me exceedingly, although I pretended to get angry at it. I tried to increase this girlish appearance as much as I could by allowing my hair to grow as long as I dared without offending too much against custom, parting it in the middle and letting it fall over my forehead in bangs. Whenever I could, I put on pieces of female wearing apparel, if but for a moment, and I should have liked very much to put on the entire dress of a girl, but never had a favorable opportunity to do so. When my



heard began to grow, which was about my twentieth year, I was at first very much annoyed by it.

"When I was twenty-two years old, a young man, two or three years older, one night proposed to sleep with me. I had never been in bed with another person since early boyhood, and the proposition threw me into violent agitation, partly embarrassment, partly sexual desire. I consented, but when we got to the room, I was troubled about undressing before him. On some pretext I managed to have him undress first and get into bed; then I turned out the light and undressed. As soon as I got into bed, he threw his arms and legs around me, hugged me, and asked, 'Dear, how shall we do it?' I did not know just what he meant, but asked him to kiss me. This he did passionately on my mouth, and then put my hand on his genitals. For a while we practised mutual masturbation. Presently he turned me on my belly and tried *penem in anum meum immittere*. By this time I felt that I was in the absolute power of my lover and must do or suffer whatever he told me to. The act he was then committing was not pleasant to me in itself, but the feeling of utter powerlessness in his arms was very delightful. He did not succeed, and presently he turned me on my side again. We spent the rest of the night in mutual caresses, and I handled his penis a great deal. I did not like to have him do the same to me, and when he noticed this he desisted. About this time some comrades took me to brothels twice, and on both occasions I performed coitus easily, but without having the pleasurable feeling excited by the embraces of my male lover. Two years later, when I again attempted coitus with a girl, I failed. After the first night spent with my lover in the manner described, my sexual life seems to have first awakened to its full flower. I slept with him repeatedly after this, and always enjoyed his embraces exceedingly. On one more occasion he attempted pederasty, with no different result. These are the only times I have ever submitted to passive pederasty, and never have I even felt a desire to commit it actively. I consider pederasty a vice, while my own mode of sexual enjoyment is certainly harmless, and to persons constituted like myself, natural.

"The acme, however, of all the sexual pleasure I ever experienced did not come till I was twenty-seven years old. For some years I had been very intimate, as I still am, with W. When I first met him he was but sixteen years old, while I was twenty-three, but he was very much developed and had the appearance of nineteen, while I could have passed without difficulty for a youth of the same age. Almost from the first moment of our acquaintance I became his devoted subject. I ran errands for him, blacked his shoes whenever I had an opportunity, sewed buttons on his trousers, and in every possible way acted as his obedient slave. A kiss or embrace from him was my greatest delight. He was a very athletic youth, and it gave me great pleasure to wrestle with him, although otherwise I dislike physical exercises requiring strength which I do not possess. But it was very sweet to feel myself in his grasp, and be utterly powerless to resist. However, for over four years I never had the opportunity to sleep with him. Finally the opportunity came, and I went to bed with the sweetest anticipations. I was not disappointed. My master soon began to embrace me, and presently to handle my penis. He was quite rough in this, and caused me pain. So I begged for mercy. Then he turned me on my back, and *incumbens mihi coitum inter femora habuit*. The pleasure I felt at this was indescribable, and my love for him was heightened to the utmost. I felt as if now in some way I had become a part of my master, and could never be divided from him again. After this I had sexual intercourse with him quite often, and for two months we really lived together as husband and wife. That is, I kept his rooms in order, prepared some of his meals, did his mending, and similar things, and nightly shared his couch. Several times, instead of having *coitus inter femora*, *penem in os meum immisit et ejaculavit*. I did not like this so well, and kept my lips closed, but he forcibly opened my mouth and I had to submit. Besides those mentioned, I have had intercourse with a number of young men. Ordinarily, all that I desire is to be closely embraced by them while lying in bed, preferably in a nude condition. This is sufficient for me to cause ejaculation. I always try to induce my lover to treat me as if I were his slave. I love to kneel before them, to kiss their hands and feet, to dress and undress them, to blacken their shoes, to bathe them, and do similar things. If they speak harshly to me, kick or strike me, I like it so much the better. My lovers must be about my own age or younger, but boys before puberty do not attract me sexually. I prefer they should be handsome, and I could not submit to the embrace of a person of repulsive appearance. Also, I must have some feeling of friendship for them. I could not think to submit myself to one whom I had to pay for it, as some persons constituted like myself do. I should feel like a prostitute. In my intercourse with my lovers I always feel like



a woman toward them, and regret very much that usually I am compelled to make the first advances. However, opportunities for complete satisfaction of my sexual desire have been comparatively rare, and I fell early into a habit of imagining myself as a woman or slave-boy, and having intercourse with men, never with women. Often I elaborated extensive imaginary adventures, of which I append a few examples. These imaginings always caused erection and often ejaculation.

"Two years ago I married, and I am perfectly happy with my wife, who in a general way understands my condition and is resigned to it. I have never had perfect coitus with her. The nearest I came was on the wedding-night, when I effected penetration, but no emission. I can have an imperfect erection and emission when with her, but only by imagining myself being embraced by a man. From my own experience I must dissent from some of the views expressed by Krafft-Ebing on this subject (*Psychopathia sexualis*, Chaddock's translation). Of course, the condition of persons constituted like myself is abnormal. But there does not seem to be a good reason to class them as allied to the insane. It may be that most of the biographies of sexual perverts are of persons who, in addition to being homosexual, have some other defect. The fact that their sexual peculiarity seems to be the one matter uppermost in their thoughts seems to point in that direction. There are excesses of homosexual feeling as there are excesses of heterosexual life, and only these ought to be reprobated as vicious or pathologic.

"I do not feel that my homosexuality has materially interfered either with my happiness or my success in life. It is sometimes inconvenient on account of the difficulty of sexual satisfaction, and I do regret my inability to have children. But these are sorrows such as all must suffer in one form or another. I do not think that there is much danger of disgrace to an urning who does not give himself up to vice. But I could wish that the present ignorance and the injustice which flows therefrom were done away with, and if I can contribute to aid the scientific labors of men like Krafft-Ebing, Moll, and Chaddock in this direction, I should be glad to do it.

"In closing I will add a few more details about my physical and mental characteristics, as I see them. I do not smoke, and drink very little, not from conscientious scruples, but from lack of inclination. Like a woman, I am easily moved to tears. I blush easily, especially at the mention of some obscene matter. I very much dislike the male habit of telling vulgar stories. I love to be with ladies and enter into their talk about dresses, embroideries, and the like. W., who has now known me intimately for more than ten years, says that within the last few years I have grown less feminine in manner and appearance. This must be ascribed, I suppose, to my increasing age. I will add that I am a lawyer, having pursued my preliminary studies while earning a living as a newspaper man. I cannot whistle, run fast, climb trees, or throw a ball, except in the characteristic manner in which a woman throws; neither can I shoot, for, as I am told, I hold the gun like a woman.

"One of the favorite plays of my imagination, and one which I have even told to two or three friends, is the following: 'As a youth of nineteen or twenty I became acquainted with a young man about twenty-seven years old, with whom I soon fell violently in love. After a while he proposed that we should room together. Of course I accepted with the greatest delight. On the evening of the first day of our common life, however, I was thrown into violent agitation when my friend pulled me down on his knees and kissed me on the mouth. At this I blushed so violently that he laughed and exclaimed, "See little innocence blush!" Finally he undressed and went to bed, but I could not for quite a while overcome my modesty sufficiently to follow his example. At last, with a great effort, I got courage enough to undress, but first I turned out the light. When I had got into bed, I lay as far away from him as possible, so as not to touch him, although I was burning with a desire to embrace him. But very soon he put his arms around me, and in doing so felt my breasts. In a tone of surprise he cried, "Kid, are you a girl?" This made me blush furiously, and my voice was almost choked by embarrassment, which was yet a profound pleasure, when I replied "No."

"From this time on I lived with my friend in a relation that was partly that of a wife, partly that of a slave, partly that of a son or ward. He would often embrace and kiss and in other ways caress me, let me sit on his knees, play with my hair, etc. Often he would bring me sweetmeats and flowers. In this way he would treat me like a girl. On the other hand, I had to wait on him, run errands for him, and if I did not obey him with sufficient alacrity, he would strike me or otherwise punish me. This did not often happen, for I was very willing indeed to obey his slightest behest. I looked upon him with the greatest reverence and never ventured to address him as anything but Mr. Of course, I had to blacken

his shoes, help him dress and undress, and darn his stockings. He had forbidden me to smoke, for which I indeed had no liking. But one day he caught me smoking a cigarette in a crowd of our comrades. He did not say anything then, but when we had got back to our room, he ordered me to bring him a cane which stood in a corner. I obeyed without guessing his object. Then he told me to lower my trousers and drawers. Now I knew what was in store for me. Most boys of twenty would certainly have felt that they were too old to be punished in that way. But the idea that it was possible to resist never entered my mind. Trembling with fear I obeyed, for I am very sensitive to pain. Then I lay down on the bed, at his direction, and he gave me a sound caning on my bare podex, until my tears and promises never to smoke again showed him that the punishment was sufficient.

"It will be seen that many features of this tale are based on my actual experiences.

"Another favorite tale which my fancy conjured up was the following: 'I am a beautiful youth about eighteen years of age, and reside in a beleaguered city. The town is finally taken by storm, and everywhere carnage and rapine prevail. Myself, together with other boys, take refuge in a room where we huddle together in a corner, fearfully awaiting our fate. Presently a band of warriors bursts into the room, threatening to kill us. I throw myself at the feet of one of them and implore his mercy. He seizes me in his powerful arms and carries me off, laughing at my tears and cries for help. The other boys are seized by warriors in like manner, and we are taken on board a vessel and shipped to the enemy's city. There we are made to walk naked in the triumphal procession, and finally taken to a large building where boy-slaves are trained for service. Here we are taught to dress and undress gentlemen, attend them in the bath, etc. At the same time we are made to show the most abject submission to our superiors. We must receive their commands on our knees, kiss their feet, etc. In the mean time every means is taken to increase our beauty. We are bathed, or rather bathe each other; our hair is allowed to fall in curls over our neck and shoulders; our arms are adorned with bracelets, and our ears with rings. We learn to sing and dance, to wind garlands of flowers, with which we crown each other and our superiors.

"Finally, after a course of such training, I am thought fit to be sold as a page or valet. I am taken to the market-place and exhibited to the gaze of the people. Purchasers crowd around, they admire my beauty, feel of my arms, legs, and body, stroke my hair, and haggle with my keeper about the price. At last I am bought by a young man of radiant beauty, whom I follow joyfully to his home to serve as his page.'

"It is also very pleasant to me to imagine myself treated like a child, although in reality above that age, as in the following imaginative adventure:

"I am a youth of eighteen or nineteen, but my appearance is such that I am usually taken to be much more youthful. One day I am paying a visit together with a comrade at the house of a friend of the latter. There are in our host's family a son about my own age, a girl of sixteen, and a boy of thirteen or fourteen. Every one, not knowing my real age, treats me as if I were of the age of the youngest boy. The lad of my own age patronizes me, pats me on the head, and introduces me to his little brother as a new playfellow. The girl calls me by my given name, although she sees me that day for the first time, and with all the superiority of sixteen gives me to understand that I am only a child. All day I play with my thirteen-year-old comrade. At nine o'clock in the evening the nurse enters, and my little friend's mother announces that it is time for children to go to bed. My friend, according to his custom, bids the family good-night, and gets a good-night kiss from every member. I am bidden to follow his example, and in turn receive my good-night kiss from everybody, including the young lady. Then the nurse takes my little friend and me by the hand and leads us up-stairs. There she undresses us, and we kneel down in our night-dresses to say a childlike prayer. The nurse then puts us to bed, kisses us good-night, and puts out the light."

This case, while being an instance of marked sexual inversion, offers several noteworthy peculiarities, but especially the element of pleasure in passivism and ideal subjection, purely psychic or imaginary in nature. This mental perversion Krafft-Ebing named masochism, after Sacher-Masoch, who wrote fiction with a view to the description of this anomaly. It is discussed in detail in a subsequent paragraph.

The foregoing cases have been given in all their details that a correct idea of the mental condition of such unfortunate persons may be gained.

The possibilities of a medicolegal nature that may arise in such cases cannot be understood without a just appreciation of the psychologic elements that are in play. It will be seen that these cases present some of the more elementary perversions later described, the causes and origin of which are there discussed. The association of sexual inversion and psychopathic instability is especially prone to lead to criminal acts. The manifestations of homosexual love are commonly intense; the moral resistive power is weak; thus is opened the way to minor criminal acts and to murder, out of revenge and jealousy, as was exemplified in the celebrated case of Alice Mitchell.

From the standpoint of atrocity, with seeming lack of motive, the deeds committed as a result of sexual lust are perhaps the most appalling and incomprehensible. The association of lust and pleasure in cruelty, to which such crimes often owe their origin, constitutes the variety of sexual perversion known as sadism, so called from the Marquis de Sade, who, during the French Revolution, devoted himself to writing obscene works with lust and cruelty as his theme. Schrenck-Notzing has proposed the term *algolagny* (love of pain) for this condition, to which may be prefixed the qualifying words, active or passive, in accordance with the nature of the case. This perversion may affect male or female, but it is much more frequently observed in males.

The origin of sexual pleasure in the infliction of cruelty or pain on another lies in psychologic and physiologic associations. Psychosexual emotion is normally directed toward a second person; the emotion of anger, likewise objective in direction, impels to injury of its object. They are both active impelling emotions, which find expression in physical contact with their objects, with great expenditure of power in physical movement. They are like all active expansive emotional mental states in their tendency to throw the muscles into tension and movement. From a primary psychic stage they increase to a psychomotor degree. Even the ordinary states of pleasure and delight, when they arise suddenly and reach a high degree of intensity, we know may lead to such violent acts, directed toward those whom it may be thought should share them, that actual physical injury is done, as it were, in a blind effort to give adequate motor expression to the emotional storm that is raging within. Sexual excitement is the most intense degree of pleasurable emotion, and it normally finds expression in very active physical movements, which, not infrequently, even under normal circumstances, may result in more or less physical injury and pain to its object—wholly unintended, of course. The biting of the female in the height of sexual orgasm is so common that the meaning of the assertion that Henry VIII bore the scars of his conquests on his shoulders tells at once the nature of his victories. The common direction of psychomotor excitement in sexual excitement and angry emotion, and the violence that is common to them both, makes the possibility of sub-



stitution very probable under some circumstances, as a result of experience of the spontaneous psychologic associations. Thus, intense sexual excitement in passionate individuals may induce acts of violence, the pleasure of which lies normally in the mere expenditure of energy, without reference to its effect on its object. Such experience, however, may lead to a secondary mental association of intense pleasurable excitement directly with the effect on the objects, and the latter may then gain an independent value as ideational stimulus to desire for sexual gratification to be had by the infliction of violence and pain during the sexual act. In this way the violence becomes the means intentionally employed, because of its psychoreflex effect to intensify lustful pleasure. Such an association of ideas having been once formed, a further possibility is the occurrence of sexual excitement simultaneously with anger independently excited. Moreover, intense psychomotor excitement of any kind is apt to lead to a great variety of impulses, not as a result of association of ideas, but rather because of the radiation or spreading of activity in limited cortical areas to neighboring areas. This fact will account for many bizarre associations of ideas that arise, especially in neurotic subjects, as a result of peculiar and even isolated experiences attended with intense emotional reaction.

As will be seen from subsequent examples, the possibilities of such associations with sexual excitement are numerous; indeed, they are limited only by the possibilities of accidental experience. The aggressive or active character of the sexual rôle of the male, the greater degree of his sexual excitement, and the greater ease with which it is induced in him, as compared with the female, are sufficient reasons to account for the greater frequency with which such anomalous psychosexual associations are observed in men. Sexual hyperesthesia is requisite as a foundation for the development of them, since they depend in great measure for their origin upon an intense degree of sexual excitement.

The results to the object of the violence arising out of sexual excitement may be anything from slight injury to fatal results. Violence may be inflicted during the sexual act at the acme of excitement, or after the physical sexual orgasm when the psychomotor excitement is prolonged. It may be used as a stimulus to excite sexual activity when this is impossible by the ordinary procedure in coitus.

It is not always necessary that the sadistic impulse find expression in actual infliction of violence or pain. In some cases the individual finds complete satisfaction in the mere thought of inflicting violence or causing pain, so that the anomaly is ideal or imaginary; but one subject to ideal sadism is prone to go on to actual sadism, for the imagination may finally cease to produce its accustomed effect, and sexual satisfaction be possible only in the experience of the imagined act and situation.

Krafft-Ebing is inclined to regard sadism as an original psychopathic anomaly, and this view is probably correct, in so far as it recognizes its dependence upon peculiar organization of the nervous system, by virtue of which the association of the sexual impulse and the

impulse to do violence arises spontaneously as a result of organic cerebral interrelations. Nevertheless, it must also be allowed that this perversion may arise secondarily from associations formed as a result of experience or accident. The majority of cases of sadism present also other independent signs of a psychopathic condition, and in such persons, aside from possible peculiar organic cerebral interrelations, there are other psychologic peculiarities that render them prone to develop peculiar mental associations. In them the nervous organization is often hypersensitive, leading to the formation of strange and unusual associations of ideas. Ideas accompanied by intense emotional excitement are prone to take on a definite psychic value in such individuals, and they may thus attain a specific value, and become, by virtue of primary accident or of intensity of the emotional coloring, substitutes for the more common definite associations in the majority of persons. When to such a state of psychopathic instability sexual hyperesthesia is added, the possibility of strange and unusual associations of ideas with the sexual act or sexual excitement is increased almost to a probability. Such an association as sexual satisfaction in cruelty or pain inflicted on another may thus arise spontaneously, or be developed out of associations, normally experienced, but abnormally valued psychologically, so that the primary effect of sexual excitement is developed into a cause of sexual impulsion. In either case the anomaly may become a partial or complete substitute for the normal sexual act, and the infliction of violence be the end of sexual desire, without reference to sex or sexuality in its object.

The most important form of sadism is *lust-murder*. Murder is properly lust-murder only when it is the result of sexual excitement, or done to induce sexual excitement, or as a substitute for normal sexual indulgence. The lust-murderer, especially when his act is done as a stimulus to sexual desire or as a substitute for the normal sexual act, seldom stops short of murder, but his intense psychomotor excitement leads him to mutilate in the most atrocious and savage manner the inanimate body of his victim.

The well-known Whitechapel murders were of so atrocious a character and attended with such extreme mutilation of the body that it is at once suggested that they were committed for the purpose of sexual gratification; but it is still possible that the unknown perpetrator of these frightful brutalities was actuated by an insane delight in cruelty and physical mutilation not immediately related to sexual emotion. This possibility of delight in cruelty, murder, and mutilation for their own sake is to be considered in any case where a direct sexual relation cannot be demonstrated. The following cases are examples of actual lust-murder:

The history of the case of Verzeni, reported by Lombroso, is most instructive in the clearness with which it demonstrates the association of sexual lust and violence. At the age of twelve Verzeni accidentally experienced peculiar pleasure in wringing the necks of chickens. Desire to repeat the pleasure led him to indulge frequently in the act of twist-

ing the necks of fowl, which was always attended with sexual excitement. As he grew older he extended the field of his operations to women, always attacking them with intent to grasp them by the neck and choke them. The act was always attended by intense sexual excitement (erection and ejaculation). Commonly the mere act of choking his victim was sufficient; but if the orgasm was delayed, he continued the strangulation until death resulted, when sexual satisfaction occurred. In one case he found increased delight in sucking the blood of his victim, and he even thought of cooking and eating her flesh. He made several attacks on women that ended in choking; but he killed three young girls. At the height of his excitement he was oblivious to everything but that related to the act. He had no experience of normal sexual indulgence and no desire for it, and he never paid any attention to the genitals of his victims. His discovery and conviction led to imprisonment for life.

This case is a good illustration of the accidental origin of an association of an act of violence with sexual excitement. The association once formed, by repetition became specifically sexual in direction, and entirely controlled the sexual life of the individual to the exclusion of anything like normal sexuality.

Andreas Bichel, whose case is reported by Feuerbach, was a similar monster. He was accustomed to murder and mutilate prostitutes. Of one of his victims he said: "I opened her breast and cut up the fleshy parts of the body with a knife. I dressed the body as a butcher does a beef. . . . While opening the body I was so greedy that I trembled, and I could have cut out a piece and eaten it."

Gorget reports a similar case in which the victim was a child of twelve. L. confessed that he first violated her, then mutilated her genitals, tore out her heart and ate of it, drank of her blood, and buried the remains.

Dr. Morton Prince reports a case of sadism in which the delight and sexual pleasure were found in imagining scenes of mutilation of females, without realization in actuality; but it is easy to see how short a step it might be in such a case from such intense ideas to the commission of horrible crimes. The patient was a young man of twenty-two years, apparently suffering with neurasthenia. His sexual ideas gained control of him when he would lie on the bed in the daytime, as was his habit. He would pass into a trance-like state and imagine that he was engaged in killing and mutilating women. The origin of this peculiar habit could not be ascertained; but from being mild in degree it became intensified. At first in imagination he was mutilating a single woman; later he killed them in numbers. These horrible scenes and acts became so vivid as to deserve the name of hallucinations, and at times he was deceived into believing that they were real. From killing, mutilating, and eating one girl, he progressed until he imagined himself engaged with other men in slaughtering the female populace of towns, cities, and countries. During such dreams he had emissions and most intense sexual excitement. The habit had begun at the age of ten and



persisted until the age of twenty, after that occurring less frequently. The possibility of his carrying out such ideas led to his confinement in an asylum. His family history disclosed bad heredity, and his personal history was that of a neuropath.

Schrenck-Notzing reports the case of a physician, which will illustrate another direction in which sadistic impulses may find expression. The patient became sexually excited only when he could cause pain in persons ranging in age from ten to twenty-six years. He was sexually inverted as well as sadistic. His impulse to cruelty was in the main directed to the nates of its object, for which he had opportunity in surgical operations and medical treatment. But any operation on persons of the right age caused him sexual excitement. Giving injections of any kind caused him to have erections and emissions. Not a week passed in his practice that he did not gain this kind of sexual gratification. It was also notable that the patient was not himself of average sensibility to pain.

A peculiar form of sadism is the predilection for mutilation of the dead body, found by accident or obtained by design. Such a sadistic act might be the result of lack of courage to attack the living person, this part being, as it were, carried out in imagination, the actual mutilation of the corpse fulfilling all the necessary conditions of reality.

But lust in mutilation of corpses might also arise directly as a result of experience of sexual excitement while dressing slaughtered animals. The case of Sergeant Bertrand is an example of this form of sadism. He began to practice masturbation at the age of thirteen, calling women up about him in imagination during the act. He would in fancy have intercourse with them, and then kill them and violate their corpses. The desire to realize his fancies led him first to make use of the bodies of dogs and other animals, killing them for his purpose. He would open the abdomen and tear out the entrails while masturbating. Finally, he dug up newly buried females bodies in order to mutilate them while masturbating. On three occasions he violated the bodies, but mutilation was always necessary to afford him complete satisfaction sexually, and it was never omitted.

This form of sadism seems allied to necrophilia, or the preference of the dead female for sexual purposes; but necrophilia is not necessarily sadistic in nature. The psychic origin of a preference for the dead body for sexual purposes may be in an intensification of the normal masculine pleasure in the submission of the female, which finds its extreme expression in death with the removal of all possibility of resistance; or it may arise as a result of experience of accidental association of sexual excitement and ideas of the dead, after the manner of common erotic fetichism, later discussed.

The sadistic inclination is often satisfied with acts of cruelty which stop short of anything like serious bodily injury to the object of desire. Sensual gratification may be found in the mere infliction of pain or at the sight of blood. The Marquis de Sade found pleasure in the act of coitus only when he could prick his consort in the act until the blood

came. In a case reported by de Boismont, the man was accustomed to cause his companion to make her genitals bloody by means of leeches. This case may have been an instance of erotic fetichism arising out of coitus with a menstruating woman or the idea of virginity: The desire to draw blood by some slight injury, or the sight of blood, is frequently the extreme necessity, but in many cases the sadistic impulse may find similar satisfaction in whipping or abusing the female physically.

As has been shown in the preceding cases, the sadistic impulse may be associated with the need to perform the normal act of coitus, or it may find satisfaction in the mere act of cruelty without regard to normal sexual indulgence. It may also, in those subject to sexual inversion, be directed toward the same sex.

It has been found that acts of humiliation of females done by men are often the result of perverted sexual feelings. Since they have for their object the infliction of suffering on another, they might justly be classified as sadistic in nature. Such impulses often find expression in defilement of the female person with urine, feces, etc. The defilement of women and their dresses with ink, oils, etc., is also probably sadistic in nature, but it is difficult to account for the origin of such a peculiarity of desire. Several cases are on record where men have found sexual gratification in forcibly cutting women's hair from their heads, but such cases have usually presented the characteristics of erotic fetichism.

So-called symbolic sadism is a variety of this perversion in which the sexual gratification is found in situations or acts which suggest the infliction of pain, suffering, or humiliation, without actually causing either. Sexual satisfaction is found in the mere suggestion of the pain endured by the passive party.

The foregoing cases also show that the sadistic impulse may be directed toward any living thing, its object being chosen as a result of opportunity, chance, association, or circumstances. Children may be unnecessarily or too severely punished as a result of sadistic inclinations in male teachers, where sexual inversion often is simultaneously in play. The wanton torture of animals not infrequently is due to a similar cause, either as a primary manifestation in those ignorant of sexual things, or as a substitute for sadistic acts with females, performed by men more experienced.

The psychic side of the feminine sexual rôle is the opposite of sadistic in its tendency, but the female, like the male, at the acme of sexual excitement may take violent hold of her companion; and such an experience in a passionate and neuropathic woman might lead to such a preference, as in a case reported by Moll, that the wife finds her most perfect satisfaction in biting her husband until the blood comes. But sexual inversion in the female, which causes her to assume the aggressive sexual rôle, is capable of developing a true sadistic character. Doubtless some of the cruel and passionate women of history owed their peculiar inhumanity to sexual inversion and sadism.

The frequency of neuropathic and psychopathic taint in individuals subject to sadism, as well as the other perversions of the genetic instinct, cannot be too strongly emphasized, but such a foundation is not absolutely essential for the development of such anomalous desires and acts. Owing to the frequency of sadism in all its forms, when peculiar or strangely atrocious acts of cruelty and mutilation are committed, their possible sadistic nature should be considered, especially in the absence of sane motive or insane delusion. Such acts are often, in their origin, expressive of a sexual nature, but often their sexual origin is not indicated by their character. But cruelty is a common manifestation as an independent psychic phenomenon, and to prove the sadistic nature of any act of cruelty its direct relation to sexual activity must be demonstrated. The responsibility for such acts by sadists is a matter to be determined aside from the acts themselves, though they always raise the question of the possible existence of other abnormal mental factors that have a bearing upon the question of moral responsibility.

The opposite of sadism, or active algolagny, is masochism, or passive algolagny, another synonym for which is passivism. This psychosexual anomaly consists of pleasure in the subjective experience of violence and pain as an aid to sexual enjoyment or as a substitute for normal sexual indulgence. This perversion, like sadism, has its ideal side, where the desired result is attained through the mere idea of pain, violence, or subjection caused by the active party, without any actual physical realization of the imagined situation. The psychic origin of this perversion is to be found in the normal psychosexual side of the sexual relations of the female. Woman finds her greatest sexual satisfaction in submission to masculine sexual domination; and the extent to which she prefers this subjection and submission may be taken as a measure of her femininity, always, of course, tempered by reason and general character of mind under normal conditions. Her physical share in the act of procreation is necessarily passive, and out of this necessary condition has developed the mental side of passivism—readiness to submit, and satisfaction in submission to sexual domination by the male. This normal feminine psychosexual passivism might become abnormally exaggerated, so that the woman could find sexual satiety only in a violent experience of the power of her sexual master; and such a mental anomaly might go so far that preference of physical violence would become a necessary accompaniment or substitute for normal sexual indulgence. This anomaly in women is, however, comparatively rare, probably owing to the milder degree of sensual endowment normal to the female sex.

As a sexual perversion, masochism, or passivism, is, like all psychosexual anomalies, comparatively much more frequent as a manifestation in males; it is one aspect of sexual inversion, or, as is most frequently the case, it may be a distinct perversion without inversion in other respects sexually. The sexual desires of the man subject to passivism find satisfaction in sexual subjection, humiliation, and abuse, which may go to the extent of a desire for violence and cruelty at the hands



of women or men, depending upon whether there is partial or complete psychosexual inversion.

It is necessary to distinguish between passivism and flagellation as a stimulus to sexual desire. Passivism is essentially a psychosexual anomaly of early origin in the life of the individual, originally psychic in origin; pleasure in flagellation for its own sake is usually an anomaly of secondary origin. In other words, passivism is sexual pleasure in the idea of subjection; sexual pleasure in being subjected to flagellation depends upon the physical stimulus applied. The origin of sexual pleasure in being whipped is usually found to be connected with a decline of virility as a result of excesses in venery or onanism, and by accident the reflex effect of stimulation by whipping is found to act as an excitant to sexual power, and then becomes habitually employed as a preliminary to normal sexual indulgence; or it may even become, as in the case of other sexual perversions, a complete substitute for the normal sexual act, which is omitted from lack of ability to perform it or from lack of pleasure in it.<sup>1</sup>

The purely psychic nature of the anomaly of passivism is further emphasized by those cases in which the desire for subjection, humiliation, and violence is entirely ideal. In such cases any attempt to realize in physical violence the imagined relations results in sudden disappearance of all sexual pleasure and desire; actual physical pain banishes the pleasure that depends entirely on a psychic state.

Those subject to passivism resort to a great variety of procedures to gain the desired end. One finds satisfaction in being severely whipped; another in being trampled upon by a woman in heavy shoes; another in being chained as a slave; another in foul abuse and vituperation at the hands of another; another in being subjected to hanging in farce, etc. Still more disgusting practices may be the means of attaining sexual pleasure—defilement with excrement and the like.

Passivism is not infrequently combined with sadism in the same person, and the passivist is frequently subject to some variety of erotic fetichism—for example, the shoes that bring sexual pleasure when they cause suffering, may attain an ideal value and act as a sexual excitant when merely thought of or seen.

The medicolegal importance of masochism is small as compared with that of sadism; but it is capable of raising many legal questions arising out of actual injuries, marital relations, and mental soundness; and its possible combination with sadism is to be remembered.

Sexual perversion very frequently takes the form of *erotic fetichism*. This anomaly may be defined as sexual pleasure and satisfaction found

<sup>1</sup> Jean Jacques Rousseau, in his *Confessions*, Book I, speaks of "the punishment of infants" that he received from his governess, in which he experienced "a degree of sensuality mingled with the smart and shame, which left more desire than fear of a repetition." He stated explicitly that the same discipline from her brother would have produced a quite contrary effect; and he gives his reasons for mentioning the matter—that it pointed out an evil as frequent as it is pernicious. So the perversion may be associated with the development as well as with the decline of virility.—EDITOR.

in relation to objects that normally exercise no sexual influence on the mind. Like sadism and masochism, erotic fetichism may be shown to be but a gross exaggeration of mental peculiarities that are normal. Thus, the distinguishing marks of the sexes—physical, mental, and artificial—all gain normal psychosexual significance for the opposite sex. Thus are developed individually an infinite variety of sexual preferences. One person prefers this physical character, that mental quality, or some particular style of dress in those toward whom he is sexually attracted; and such a means of attraction may become so essential that attraction is wanting in its absence. When a sexual preference has reached this degree of intensity and power, the condition borders on the pathologic. Beyond this degree, the characteristics or qualities that should normally serve as merely one element in the activity of sexual desire and satisfaction, become absolutely essential as a means of inducing sexual excitement, and they may even become in themselves the object sought—the normal sexual act fading into insignificance by the side of the sexual pleasure found in the particular object, which has thus become a veritable fetich.

The origin of erotic fetiches lies undoubtedly in early mental associations. The occurrence of primary sexual excitement in association with particular persons, in particular situations, or characteristically dressed, or under peculiar circumstances, is the only way in which to account for such a psychosexual anomaly when it is of early development. When of late development, it is to be explained by accidental experience of greater pleasure under the peculiar conditions that are later cultivated and employed by preference. Observation of cases shows, moreover, that those subject to this anomaly are frequently psychopathic or neurotic, and it is in such persons, prone to the establishment of peculiar mental associations and to intense emotional activity, that early associations of a special kind are formed and become dominant. The neurotic and psychopathic are for this reason frequently subject to psychosexual hyperesthesia, and thus they may become the ready slaves of some early and peculiar sexual experience. For the same reason erotic fetichism is often found associated with other sexual perversions, like sadism, passivism, and sexual inversion.

The objects that may become the controlling fetich of sexual inclination are infinite, but they may be divided into those that have an obvious sexual significance, such as parts of the person or articles of dress; and those that are devoid of any relation to sex, as some indifferent inanimate object, like furs.

Erotic fetichism most frequently affects males, but it may also affect females. Owing to the fact that it is a frequent cause of the commission of crimes by its victims, it has gained some medicolegal importance. When some part or physical peculiarity of the female person is the object of erotic desire to the exclusion of all else, the presumption is that the condition is pathologic; when it is a necessity for the performance of the sexual function, or when pleasure in it takes the place of normal activity, it is certainly abnormal. Peculiar features

of the female person that are normal means of sexual attraction frequently become pathologic fetiches, as the eyes, the lips, the hair, the feet, the bust, the hips. The man subject to this variety of erotic fetichism may be led to take criminal liberties with women in order to satisfy his desire. Forcible kissing of women in public places is doubtless of this nature; the stealing of hair from the heads of girls and women is another well-known form in which peculiar gratification of sexual pleasure is found. Pressing and rubbing against females in crowded places is another frequent act of the erotic fetichist. When any part of the female person is a fetich, should this anomaly be combined with sadistic inclinations, there might be grave crimes committed, ending in murder and mutilation for the possession of the fetich. The theft of hair for gain must be distinguished from the act of robbing a woman of her hair for the sake of possessing the hair for its sexual effect: the sexual relation must be shown.

For the reasons already given, objects of female apparel often become the object of erotic desire and enthusiasm. Gloves, shoes, handkerchiefs, lingerie, dresses of particular materials, and the like, may become fetiches, either primarily by association, or secondarily by substitution, as when enthusiasm for the gloves is substituted for a primary erotic preference for the hand. When such objects of dress are erogenous fetiches, they may easily lead to theft for their possession; for the erotic fetichist is not usually satisfied by the mere contemplation of the object of his desire; his impulse is to handle it, and, by fondling it, to induce sexual gratification in an orgasm.

The further an object of erotic fetichism is from the normal class of means of sexual attraction, the more significant is it of disease; the more probable is its origin in early sexual association.

The well-known erotic enthusiasm for furs and velvets for their own sakes is of this class. A peculiar case of sexual satisfaction found in cutting silk dresses on ladies has been reported. The peculiar fetich was in reality the sound made in severing and tearing the fabric.

The abnormal character of all the sexual perversions, and their frequent association with psychopathic and neuropathic conditions, raises the question of legal and moral responsibility. It may be said that the existence of such an anomaly *per se* does not raise even a presumption of irresponsibility, but it should be a reason for a thorough examination of the mental condition of the individual. In order to establish the irresponsibility of a person who has committed a crime as a result of sexual perversion, as in the case of any criminal, it is necessary to show that the crime was the expression of an organic necessity over which there was no possibility of control; that, owing to peculiarity or defect of nervous constitution, the criminal was incapable of developing or acquiring the ideas and feelings which act to inhibit or prevent yielding to animal or organic impulses; or that disease has intervened to destroy or suspend the action of restraining moral ideas, previously effectual in keeping the individual within the bounds of common morality. Thus, in those subject to sexual perversion, irresponsi-



bility for crimes is to be proved as in the case of any other mental disease.

In the case of the sexually inverted who indulge in minor offenses against public morals and decency, and restrain themselves in other moral relations, there can be no question of irresponsibility. Their case does not differ from that of the normal individual who allows himself to become immoral in obedience to normal sexual inclinations. The one should be punished with the other. The law, of course, recognizes the necessity of sexual relations for the normal man and woman, and provides for it, but it is not a recognition of sexual pleasure for its own sake. The so-called urning, or subject of congenital inversion, who demands of the law a recognition of his peculiar means of sexual gratification, is asking of the law what it has never yet granted to the normal man—recognition of the legitimacy of sexual pleasure for its own sake. If men at large should ask to have their unnecessary and immoral sexual pleasures recognized by the law as specifically permissible, they would be asking no more than the urning now demands. He already enjoys, as do the normally constituted, the possibility of secret indulgence in immorality and gross sensuality; and demand for its recognition in his case, fortified by a meretricious appeal to nature, is quite as absurd as would be a similar demand on the part of a normal man. The laws of morality and the laws of nature do not always operate harmoniously, but humanity cannot afford to abandon the general beneficent restraining influence of moral laws for the benefit of the few who are so unfortunate as to be so ill constituted by nature that they are injured, rather than benefited, by that which operates for the good of the majority.

# MALINGERING AND THE FEIGNED DISORDERS

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MALINGERING, probably derived from the French, *malingre*, sickly or feeble, has come to have in English the meaning of feigning illness or injury. Apparently the term was first applied to soldiers feigning some illness in order to escape from duty, but has come to be used very widely and is frequently heard in the law courts.

The decision as to whether a disability or illness is genuine or assumed has come to have much greater importance of recent years than formerly, because of the great increase in the number of actions at law brought for the collection of damages for injuries, the tort cases, with which, in this country at least, the courts are crowded. One writer, an official of a company issuing insurance against such claims, a few years ago estimated the number of these claims in a year in this country at not less than three hundred thousand. A patient of mine, for a good many years an officer on the police force of Boston, once said to me that when he first came on the force one heard only calls for the police when there was an accident, while now all that one heard was a cry of "witnesses, witnesses," which illustrates the change in the point of view in regard to accidents that has taken place. While the creation of other methods of adjusting claims for damages from accidents, such as the Industrial Accident Board in Massachusetts for deciding cases of this sort between employers and their employees, has lessened the burden of these tort cases upon the courts, nevertheless, transferring to these boards the adjustment of these claims has not of course lessened at all the chance of fraudulent claims being made. However, the more elaborate forms of fraud are less apt to come before boards adjusting claims for injuries received in industrial occupations for various reasons. Working men at their occupation have no great opportunity of claiming an accident has injured them when none has occurred, and the return in damages recovered is not likely to be great enough to attract the professional swindler. Even in these cases, however, the examining physician or surgeon meets with deception which usually takes the form of exaggeration of the severity of the real disability, or a prolongation of the period of incapacity. This latter tendency, however, is much lessened by the method of compensation in these industrial cases by which the injured person while incapacitated is paid a weekly sum which is less than he could earn if he were at work again. Under older methods of awarding damages when

a workman was injured he usually had to bring suit against the employer and then when damages were given the amount was paid at once, even though the man was still suffering from disability due to the injury, and if this disability were feigned or exaggerated the claimant could easily obtain employment elsewhere, with very little chance of detection, and so profit to a considerable extent by gaining a larger sum of money than he could have earned by continuous employment.

Practically all writers upon malingering agree, however, that feigning of disease is much less common than the exaggeration of the severity of the disability, or prolongation of this, and swindlers more frequently try to ascribe some former trouble to an accident or injury than to feign a non-existent trouble. While in countries like the United States of recent years the feigning of disease or injury for the purpose of collecting money damages has undoubtedly increased greatly, other reasons for fraud of this kind have been reduced in number. Though fraudulent blind beggars and the like are not unknown, the activities of the police authorities of cities in preventing begging have undoubtedly lessened the profits of this mode of making a living. While the numbers of cripples and blind left after the war may increase somewhat the numbers of beggars for a time, it is much more likely to cause fraudulent claims for government aid to be made. In former times when begging was unrestrained, and many cripples had to resort to it in order to live, the results were at times so satisfactory that not only was fraud rampant, but beggars not infrequently resorted to factitious maladies to excite sympathy and extort coin from the tender hearted, so that even gross frauds were practised, such as fastening a piece of raw meat to a breast or a limb to imitate some foul ulcerated growth, or went so far as to produce injuries in various ways, such as ulcers, from binding a copper coin to a limb, or by other methods. It may not be out of place to remind the reader of the practice in use not so many years ago of crippling and maiming children or others in order to increase their earning capacity as beggars, a proceeding that seems almost too revolting to be true, though perhaps not without its more modern counterparts in other directions, where human beings are exploited or degraded in various ways for purposes of gain, from the so-called white slave trade to other perhaps less culpable forms of profit making.

Malingering in the army and navy in order to escape duty has always been fairly common. In the past and especially in countries where conscription for the service is enforced it was exceedingly common. In the merchant marine, certainly not many years ago, all captains were familiar with a few drastic and nauseating mixtures, the principal ingredient of which was usually Epsom salts, which were commonly used as the first remedy given from the medicine chest when a seaman complained of illness, with the idea that the violent and unpleasant results would check any attempt to continue a feigned illness, and discourage others from attempting to escape duty by similar complaints. The improvement of conditions of service in both the army and navy of practically all civilized nations, as well as the



increase in liberty given the private soldier and the common sailor, has done much to lessen the evil formerly so common. Still in countries where conscription was enforced it has never been uncommon to see various methods resorted to in order to escape the dreaded service, the self-amputation of fingers and other mutilations not infrequently being inflicted, and older writers speak of the filing and extracting of the front teeth in order to render the man unfit to bite off the end of the old-fashioned cartridges.

In time of war feigning of defects and injuries or illnesses and self-inflicted injuries at once become much more common. This certainly was the general experience in all the armies during the recent World War, where the terrible exposure and hard conditions of service in the front line whether in the trenches or during active field operations were such that many men, not cowards, under these conditions with resistance lowered by loss of sleep and the inability to get food regularly resorted to self-injury or feigning. The large number of gunshot wounds of the hand made officers suspicious, though frequently the lack of conclusive evidence that the wound had been purposely self-inflicted, and perhaps a certain sympathy with the man trying to escape from such terrible conditions of service, kept down the number of cases tried by military courts for self-inflicted wounds to a much smaller number than the facts probably warranted. Aside from cases of self-inflicted wounds it was not uncommon to see other methods tried in order to secure the relief from service afforded by a longer or shorter stay in hospital. Among the most common of these were the production of gastro-intestinal disturbances by eating cordite from cartridges, the production of abscesses by the use of various expedients, and the putting of egg albumin into the urine to simulate trench nephritis, and the production of jaundice by the ingestion of picric acid.

The feigning of insanity by soldiers, too, was not so uncommon, though the best known instances of this have been where it was done by prisoners of war in order to obtain the better conditions and food given in a hospital, or in order to effect exchange or removal to a place from which escape might be possible. One account has been published where the feigning of insanity was successfully carried out over a period of many months by two English officers who had been taken prisoners, and by this means finally procured their removal from a prison camp in Asia Minor to Constantinople, where they seem to have been able to impose upon even the well-trained medical officers under whose observation they came at that place, so that their exchange as incurable was about to be arranged when the end of the war came. Much more frequent than the feigning of insanity in war is that by persons accused of capital crimes. Occasionally insanity may be feigned from other motives, an instance from ancient times being that of David. It is common to think that the detection of simulated insanity is easy, and when it is attempted by ignorant persons whose conception of insanity is of wild irrational actions and wandering remarks, with no attention to the surroundings, this is true, as the lack

of correspondence, in such cases, between the assumed symptoms and any type of mental disease is easy of recognition by one with training in mental diseases. When the feigning is done by a person of more education and intelligence, especially if there is some familiarity with mental diseases, or where the person has been coached by a physician who knows these diseases, it can only be detected by prolonged observation. The successful simulation of insanity by the two English prisoners spoken of above is an example, as they had some advice from a medical officer as to what forms of insanity could be most easily imitated, and yet even then the delay in the examination of the cerebrospinal fluid of one of them was all that prevented the discovery of his fraud, and with both these men, in spite of the strong motive for success, detection from relaxation of watchfulness was barely escaped several times. Because of the difficulties in discovering fraud of this sort in some states the courts may order persons suspected of feigning insanity to be placed temporarily in hospitals for the insane for the purposes of examination and observation.

Epilepsy, curiously enough, is quite frequently feigned. Occasionally this is done in order to substantiate a plea that a crime of which the person is accused was committed in a maniacal state following an epileptic convulsion. More often the attack of epilepsy is imitated by persons seeking hospital care, or by inmates of prisons and reformatories desirous of avoiding work, and not infrequently by soldiers anxious for discharge from the army or seeking compensation. Occasionally these simulators become very expert in their imitations of genuine epileptic attacks, and instances are known where they have received quite severe injuries from the fall at the beginning of the seizure, as where one "dummy chucker" broke several ribs by throwing himself from a ladder upon which he was standing when he chose to start his attack.

During the recent war the Examining Boards who saw the men who had been summoned for examination and classification under the draft law met with a good deal of feigning by men who wished to escape the liability of service, though this was usually limited to the feigning of some physical defect, such as deficient eyesight or hearing, rather than the simulation of some disease, the latter being more often seen in cases where money damages are being claimed. This, of course, is because the claiming of some defect of this character in which the examination depends largely upon the replies given in order to draw conclusions as to the facts, is less difficult to carry out than more elaborate schemes of fraud. Aside from the simulation of simple disabilities such as has just been spoken of, perhaps the feigning of nervous disease is more common than that of other varieties of disease, partly because they have fewer visible external signs than most surgical or medical diseases, and partly because the popular opinion, which is shared indeed by the medical profession to some extent, is that nervous function is something indefinite, about which little is known, and that nervous diseases obey no recognized laws. In order to detect fraud,

therefore, a wide acquaintance with medicine as a whole, including internal medicine, neurology and psychiatry, is perhaps even more important than a knowledge of surgical affections, partly because the latter are less easy to feign, and partly because not only must recent injuries be diagnosed, but remote consequences of injuries must be recognized. In fact, examining physicians as a rule are rather more apt to fall into the error of considering some disability to be feigned through a lack of the wide variety of experience required than to be deceived by simulation. Even in the feigning of entirely subjective symptoms claimants are prone to make errors through the lack of knowledge of the natural combination of symptoms in disease, so that detection by an experienced physician is often easy. Where the detection is difficult it is usually due to the lack of opportunity for the repeated examination and prolonged observation that is at times required to detect a skilful fraud. On the whole, however, it is probable that more innocent persons have been regarded as frauds than the reverse, largely because of the ignorance of hysteria of so many physicians.

Fraudulent claims of disease and injury are best considered under three headings: first, exaggeration of symptoms actually present; second, substitution of causes, including factitious injuries or symptoms; and third, simulation.

### EXAGGERATED AFFECTIONS

This form of fraud is at once the most common and the most difficult to detect. A slight sprain is easily magnified into a serious one, and the persistence of pain on use after a sprain or fracture is past the stage of acute reaction to the injury, when there are few or no objective changes to be discovered by an examination is common enough and variable enough in its duration to make this form of fraud almost impossible of detection. Here, as with complaints of pain from healed fractures, deformed joints, old injuries, hernias, tumors, and the like, probably the only reliable means of judgment is full and reliable information as to the claimant's daily life and activities in order to show how much limitation upon these has really been produced by the pains and tenderness. As a rule the general aspect of the claimant is of some value in estimating these things. The person who suffers from constant pain from an injury, with sleepless nights for long periods, usually shows some evidence of suffering in his general aspect, the face is drawn, the expression that of fatigue, and the color poor from lack of exercise and rest. Sometimes unexpected pressure on a part which is claimed to be very tender, when the subject's attention is directed to another part of the body, may aid one in the detection of fraud. On the other hand, some of the physical reactions to pain, such as a sudden start when a tender area is accidentally touched, flushing of the face, perspiration, or the dilatation of the pupils when pain is complained of, may make one certain that the pain produced by pressure or motion



is severe, as these are physical reactions that are not produced by slight pain.

Exaggeration of a symptom is seldom seen, however, in the severer cases of organic disease or injury. Most such cases, as, for instance, a person who has suffered a concussion of the brain, or an injury of the spinal cord, or a fractured thigh, is in too much suffering or shock to be able to exaggerate. This appears only later, as when the man who has suffered a concussion of the brain claims that he has constant intense headache or severe vertigo. Here certain tests are of great value, such as those just spoken of, which show the reaction to pain, while for vertigo when this is claimed to be present we may try whether the vertigo is shown by unsteadiness after turning, or stooping, or is evident when the eyes are closed.

Occasionally the exaggeration takes the form of claiming that a more serious injury is present than has really occurred, as that the injury is one of the spinal cord, where it is of the musculospiral nerve only. Here, of course, a knowledge of the functions and anatomy of the various nerve tracts involved which produce the symptoms is essential.

Bailey states, and in this his opinion is borne out by the writer's experience, that the functional nervous troubles, and particularly the neurasthenic types with fatigue, and pain symptoms predominating, are the form in which exaggeration is most common. Many of the minor claims brought before the large transportation companies are of this nature, where injuries obviously minor are represented as the cause of great suffering, and many of these claims are abandoned on the offer of a comparatively small sum of money. In exaggeration of this sort we have to do with a matter which is extremely difficult to decide, and one in which the answer will always vary with the judgment of the examining physician, even when he is free from bias. An experienced physician can certainly tell serious injuries from minor ones even where he may not be able to give reasons for his decision which are satisfactory to others. Too frequently, perhaps, examining physicians are prone to forget that exaggeration of suffering is a frequent symptom of the mental states which are found in many functional troubles, and in most of which it is unconscious, and in some of them, especially in hysteria, it is beyond the control of the patient, being an essential feature of the disease. Claim agents and physicians whose work is largely limited to the examination of claimants are apt to forget or to be ignorant of the fact that unconscious exaggeration of symptoms is very commonly seen in all these functional nervous cases where no monetary claims are present. The effect of a severe accident in making the injured person easily fatigued, worried, and apprehensive about himself is by no means confined to those who are claiming damages. Again, too, in such cases the natural apprehension that the injured person feels as he first begins to go about and be more active lest this activity should bring a return of the suffering which has been experienced, may act as a cause to produce these very results which are dreaded, especially in the functional nervous disorders.

Usually in such cases judicious encouragement to keep on with the various forms of activity, and reassurance as to the absence of danger of serious results allays this return of symptoms, partly through the re-education of the patient, and partly through removing the fear and apprehension. All surgeons recognize that after injuries where joints have stiffened, whether this be directly from the injury of the joint or through disuse, it is essential for recovery of full function to disregard to some extent the pain and reaction produced at first by moving the joints, and persist in the massage and passive movements, often for a long time, in order to produce the best restoration of function to the joint that is possible. A similar and perhaps more difficult process of accustoming the sufferer again to a life of normal physical and mental activity frequently has to be used to attain the restoration of function to an impaired nervous system, many of the symptoms of this impaired function being beyond the control of the will.

Aside from the prolongation of symptoms following some injury which is produced by natural apprehension and the tendency to introspection whether in an imaginative and timid woman, or in an active, vigorous man, perhaps suffering and taken from his usual pursuits for the first time in his life, one must admit that the claimant for damages is placed, even if unconsciously, under some disadvantages to which other injured persons are not subject. These are such things as the fact that he cannot afford to overlook or minimize any symptoms if he is to get justice, and the repeated rehearsals of his story of injury and suffering to claim agents, lawyers, and examining physicians, to say nothing of undue solicitude of family and friends, all of whom are apt to fear that the sufferer is injured or even entirely incapacitated for life. Such circumstances naturally tend to unconscious exaggeration and prolongation of symptoms, where no intent to perpetrate fraud is present. On the other hand, purposeful exaggeration and prolongation of symptoms is common enough, and neither education, social position, nor calling is sufficient to make us exclude this. Many instances of deception which were very probably or even certainly not unconscious, have been known among the wealthy, socially prominent, and clergymen. It is practically impossible to distinguish absolutely by any medical examination between the unconscious exaggeration of symptoms produced by apprehension or functional nervous disturbance and that resulting from the desire for dishonest gain. Even to show that a person is unreliable in general or is untruthful at times does not actually constitute proof of fraud. This can only be considered to be present when there is available the evidence of reliable witnesses that the claimant has been able to carry on various activities with no appreciable evidence of suffering. Even where careful medical observation might give us valuable help in deciding whether symptoms are present or exaggerated, too often the opportunity for proper observation is absent. As Seguin says, in this country claimants are very rarely subjected to scientific watching, and to repeated examinations; the physician or expert is expected to deliver an opinion after one or two inter-

views with the patient, so that the chances of detecting simulation are much reduced.

To determine whether symptoms actually present are exaggerated may in many cases be difficult or even absolutely impossible, varying somewhat with the nature of the symptoms. A headache or backache may show no objective sign of its existence, and so is easier to exaggerate. In the cases where damages are claimed some indication of the probability of exaggeration may be gained from the disproportion of the amount of alleged suffering which is claimed to result from a trifling injury, which in itself tends to make the claims improbable, and it is often surprising to learn for what a small sum the claimant has been willing to sign a release. Often an experienced examiner can form a very just estimate of the degree of suffering which really exists without being able to give definite reasons for his conclusions. Certainly one can generally form some estimate from the appearance and manner of the patient as to whether he is as ill as he claims to be. On the other hand, the very frequency of exaggeration of symptoms tends to make claim agents and even experienced physicians too skeptical of the truth of complaints, and often leads to injustice. Certainly the so-called "litigation symptoms" are rare, by which is usually meant those that are falsely claimed to be present in cases where there is litigation, or produced by anxiety where there is litigation. In the various types of functional nervous disorders following injuries symptoms frequently are increased by introspection, and prolonged by the uncertainties of a law suit, but are probably never really caused by litigation. The corporation lawyers and claim agents who most frequently use these terms no doubt see many fraudulent claimants, and so it is not strange that they become skeptical about the existence of symptoms which show little or no objective signs, and so they make use of this term of "litigation symptoms," when they actually mean feigned symptoms. Any physician, however, who has had any extended experience with functional nervous disorders soon comes to know that exaggeration of suffering is by no means infrequent, though most often unconscious in these cases, and is seen fully as frequently in those in which there is no possible reason for exaggeration as in those where some motive for this exists. The case reported by Prince where an applicant for appointment to the police force presented hysteric symptoms is a striking example of a case of this sort, where every motive would have led the applicant to try to conceal his disabilities rather than to increase them. The final decision as to whether symptoms are exaggerated or not does not after all come very often to the physician to decide, and probably can rarely be decided by the medical examination alone, but must depend upon evidence of another nature. If a claimant shows no visible signs of injury or disability or even where these are present but there has been no diminution in the mental and physical activities, we are justified in concluding that the suffering is absent or slight after weighing with care the evidence that is presented to us, whether the decision comes to us to be made because we are members



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of a jury, an officer sitting in a court martial, or a physician acting as referee to assess damages.

## SUBSTITUTION OF CAUSES AND FACTITIOUS INJURIES

Claiming that an existing disease or deformity has been caused by some accident and thus making it the basis of a claim for damages is a form of malingering that is fairly common where claims of this sort are made. Naturally such forms of malingering are less common in military cases where the records of the physical examination of the malingerer on entrance into the service are available, or those made on previous admissions to the hospital. In these cases we much more frequently find factitious injuries self-inflicted with the purpose of avoiding some dangerous or even simply disagreeable duty.

In the civil cases where an attempt is being made to collect damages this substitution may not always be fraudulent. Frequently in case of disease and perhaps particularly in some forms of nervous disease the scientific knowledge of the etiology is so imperfect that the most learned of physicians is loth to express an opinion as to the relation of some injury to a disease. Where the disease has started before an injury the requirement of proof of this where it is denied by the individual concerned is often exceedingly difficult or even impossible. Bailey cites an instance where a person apparently an idiot was presented as a claimant, the condition being represented as due to a blow upon the head where the facts were obtained by sending photographs of the claimant far and wide, ending in the finding of proof that the condition had existed in Europe at the time the man came up for military service.

The difficulty of obtaining knowledge of the previous condition of a claimant has led many corporations to institute a system of medical examinations with proper records made at the time of employment, where the number of men employed is large. These records have proved to be of great value in preventing fraudulent claims for damages for various conditions, such as hernias and many other conditions claimed to be caused by falls or strains. In this way we see the industrial army coming closer to methods long ago found necessary in military service. In addition to preventing fraud these records have proved to be of great value to medicine by helping to put on a firmer basis our knowledge of the causes capable of producing various diseases and injuries. As has just been said, in many diseases and more particularly in the chronic degenerative diseases of the nervous system, our knowledge of the true etiologic factors is still defective, and prevents us from making positive assertions in regard to the influence of traumata of various sorts upon their development. Such diseases, for example, as progressive muscular atrophy of the spinal type, amyotrophic lateral sclerosis, or paralysis agitans, if the symptoms actually first appear within a moderate space of time after the receipt of a severe jar to the spine, or brain, may be due, in part at least, to the trauma, and we must



admit this possibility, though in most instances the onset of these diseases is so slow that we are inclined to suspect that the real onset has antedated the injury and been unnoticed, or else the interval has been so long that it is more probable that the trauma has had little or nothing to do with the development of the trouble. In regard to tabes and general paralysis the proof that these diseases are always caused by an infection with syphilis has become so conclusive since the introduction of the modern laboratory tests for this disease, especially those of the spinal fluid, that it has reduced trauma as a cause of them to a very secondary rôle. Perhaps the fairest way of stating this matter is to say that tabes and general paralysis, granting the presence of the causative germ, may be started or hastened in their development by trauma. As a matter of fact it will usually be found, if the true facts can be learned, that the disease has certainly started before the receipt of the trauma, and this, because of the varying rate of progress of these diseases, makes the influence of trauma upon their development very vague and uncertain.

Somewhat different is the status of trauma as a cause of epilepsy and some forms of insanity, since we know that severe injuries of the brain may be followed by such diseases. Here again the claim of an injury as the cause may be fraudulent or, on the other hand, mistaken. At times if the victim of epilepsy injures his head by the fall at the onset of an attack, and previous attacks have been absent or undiscovered, as may happen when they have all occurred during sleep, the belief that the injury caused the disease may be a natural one, and may be a difficult theory to disprove, except with a full knowledge of the facts, including not only the history of previous attacks but also of the severity of the injury. Where the injury which is adduced as the cause of the epilepsy is a slight one, or one unlikely to have produced an injury of the brain, the probability of a mistaken or fraudulent claim for the origin of the disease is very great. The same may be said of claims of injury as a cause of insanity. When the injury has been of other parts of the body than the brain, or the cerebral symptoms immediately following the injury were mild and transitory, the relation of the injury and the disease becomes very doubtful. In judging whether the trauma has been the cause of a psychosis it should be remembered that these cases follow fairly definite lines. Meyer's classification is perhaps the best and most satisfactory one that has been made. This is as follows:

1. The direct posttraumatic deliria with these subdivisions: (a) febrile reactions; (b) the delirium nervosum of Dupuytren, not differing from the delirium after operations; (c) the delirium of slow resolution of coma, with or without alcoholic basis; (d) forms of protracted delirium, usually with fabrications, with or without alcoholic or senile basis.

2. The posttraumatic constitution: (a) types with mere facilitation of reaction to alcohol, acute infections, etc.; (b) types with vasomotor neurosis; (c) types with explosive diathesis; (d) types with hysteric

or epileptoid episodes, with or without convulsions; (e) types of paranoiac development.

3. The traumatic defect conditions: (a) Primary defects allied to aphasia; (b) secondary deterioration in connection with epilepsy; (c) terminal deterioration due to progressive alteration of the primarily injured parts, with or without arteriosclerosis.

4. Psychoses in which trauma is merely a contributing factor: (a) General paralysis, with or without traumatic stigmata; (b) manic-depressive insanity and other transitory psychoses, catatonic deterioration and paranoid conditions.

5. Traumatic psychoses from injury not directly affecting the head.

This fifth group, where the relationship of the trauma to the psychosis is not direct, is much more doubtful, as we can seldom exclude other causes, and in all cases in this group one is certainly justified in assuming a favorable soil in which the psychosis can develop.

Under this same heading of substitution of causes we can best place the cases where injuries have been self-produced. Here we have no true simulation, as the injury in the case of a self-inflicted wound is real enough, the only question being as to how it was received and under what circumstances. Here we should include the cases of gunshot wounds in soldiers which are self-inflicted, which are not at all infrequent, as well as wounds of other sorts. The motive of this self-injury as has been said is generally to attain the comparative safety of a hospital, or to procure discharge from the service. In the case of gunshot wounds the difficulty of proving that the soldier inflicted the wound upon himself purposely, and the pity of the officer for some poor timid or perhaps feeble-minded man who has resorted to this method of escaping the dangers of the forward zone, a pity often increased by the knowledge that the penalty for such crimes committed in the presence of the enemy in many armies is death, leads to little attempt to prove these cases unless the facts are well-known in the command, so that there is danger to the morale of the men if it is not punished. Powder stains, burns, scorched clothing, and such things are aids in proving that a wound has been inflicted at short range and not from a distance, but may be prevented by various expedients, such as by interposing several layers of cloth between the skin and the weapon. When it is suspected that a wound is self-inflicted it may aid in detecting the deception to ask the wounded man to place himself in the exact position in which he was when the wound was received, which he is often unable to do. Then the position and direction of the wound and its relation to the position of the weapon inflicting it should be carefully considered in order to see whether the weapon could be fired by the person himself from that position.

Cuts and stab-wounds are more rare as self-inflicted injuries, and are apt to be superficial, or if deep are so only where the cut begins, pain and faintness often causing the pressure on the knife to be much lessened as the cut is completed. Such wounds are more frequent on

the left side of the body than on the right, as most persons are right-handed, and so it is easier to injure the left side than the right.

Among self-inflicted injuries we should also include the production of artificial ulcers. This was formerly done much more commonly than at present, and most often by beggars, the favorite method being to bind a coin firmly to the skin, when the continued pressure soon produced the desired effect through causing necrosis of the skin.

The World War with its soldiers with little patriotism and stamina who had been drafted into the armies of many of the nations developed some comparatively new methods of producing injuries and illnesses. Artificial abscesses from the injection of turpentine and paraffin under the skin were not uncommon. Among tests which proved useful for detecting these were the following: The oil globules seen microscopically in the pus of these abscesses will reduce osmic acid in the presence of Nile blue in contrast to vegetable oils. A drop of an alcoholic solution of Nile blue made up of 0.20 gm. to 20 c.c. of a 95 per cent. alcohol is evaporated upon the slide, and then the pus and osmic acid placed upon it. Droplets of turpentine found in the pus dry in the open air, and are soluble in ethyl aldehyd. Chemical tests may also be used. For this the pus should be treated with alcohol, when the turpentine and paraffin dissolve. Then to 2 c.c. of water add 2 drops of this solution and 1 drop of formol, when a deep brown grenadine tint appears if paraffin is present. Another test is to add 5 to 10 c.c. of this alcoholic solution to 450 c.c. of a saturated solution of picric acid, when colored drops of paraffin remain, while the turpentine rises a colorless layer to the surface.

Jaundice was produced by the ingestion of picric acid. This is excreted as picramic acid in the urine, and gives a yellow reaction with strong acids, and a red reaction with alkalies. It also produces an orange precipitate with chlorid of barium. Another method of detecting this substance is to take 2 c.c. of the urine and 1.3 c.c. of ammonia, which is shaken, after which introduce with a pipet 1 c.c. of a solution of ferrous tartrate. This is made up of 2 gm. of free ferrous sulphate, 10 gm. of tartaric acid, and 100 c.c. of water. At the junction of this fluid a ring is formed of more or less deep cherry red color, best seen against a white background with the back to the light. If more advanced reduction products than picramic acid are present there is below the red ring, usually separated from it by a colorless area, a blue ring of variable intensity.

Egg albumin added to the urine for purposes of deception can also be differentiated by chemical reactions. One of the best is Manrel's solution. This consists of 25 c.c. of a 33 per cent. solution of caustic soda, 5 c.c. of a 3 per cent. solution of sulphate of copper, and 70 c.c. of glacial acetic acid. Place 5 c.c. of urine in a test-tube, introduce 5 c.c. of this solution at the bottom of the test-tube, and if egg albumin is present a precipitate forms at once, or in a few minutes, at the junction of the fluids, while no precipitate forms with serum albumin.

With all self-inflicted injuries perhaps the most important matter



the prism first before the sound eye with the blind one closed, placing it in such a way that the prism is only partly over the pupil. This will cause a monocular diplopia. Then with both eyes open place the prism completely in front of the pupil, and the fraud can usually be discovered, as few persons would perceive the slight alteration of the position of the prism, or realize that when the pupil is completely covered by the prism the diplopia must be due to images seen with each eye separately. Another somewhat similar test is to hold a pencil between the eyes and the page from which the person is reading. When both eyes are normal reading is done perfectly easily, while with vision gone or very poor in one eye a part of the line is obscured and the line of print can only be read continuously by changing the position of the head or that of the page. Still another test is to place a strong convex lens before the sound eye so that vision with this eye will be blurred and so find whether reading can be continued with the eye which is claimed to be defective.

Still another test is that with colors, such as where a person with a red glass before the sound eye is shown to be able to read letters drawn in red on a white background. Or again alternate letters of red and green may be used with a red glass before one eye and a green one before the other, when a person with binocular vision can read the letters continuously, while a person blind in one eye would miss every other letter.

The *boîte de flées* is another method of detecting simulation of blindness of one eye. The claimant looks into a box so arranged with mirrors that two objects are seen, one with each eye, but with the images reversed by the mirrors so that the object apparently seen by the right eye is really seen by the left one, and the reverse. In this way the simulator may be shown to see with the eye which he claims is blind.

In all these tests, however, it must not be forgotten that hysteric blindness of one eye is not infrequent, and yet in these cases binocular vision is not affected, so that many of these tests give us similar results in simulation and in hysteria. With the *boîte de flées* in the case of hysteric blindness we may be able to determine the condition if we tell the patient that in this way we are testing the two eyes separately, which would not aid a simulator. In general, however, with hysteria we have to depend upon the presence of other hysteric symptoms in order not to do an injustice by accusing a hysteric patient of fraud where there is none. Of course, it is well known that hysterics frequently feign symptoms, but, as a rule, this is done in an attempt to attain some object, such as to gain sympathy, or to induce the physician to do something, as with the patient who wished an appendectomy, but more often still the symptoms are brought on through suggestion, as by seeing another patient vomit. To feign successfully the varied symptoms of hysteria itself is probably a task which would be beyond the power of anyone provided repeated examinations could be made or the claimant kept under observation. Feigning of a hysteric con-

tracted field of vision or of that found with atrophy of the optic nerve is probably impossible for anyone to carry out successfully provided careful perimetric examinations repeated on several occasions can be made.

If defective vision in one eye is claimed only, rather than loss of vision, the problem of discovering a feigned defect is, of course, more difficult, but here again careful and repeated examinations with varying test objects will usually result in obtaining such variable results that fraud becomes the only possible explanation.

The feigning of night blindness was apparently quite common in the German Army during the World War, and also in the Indian Army, but less in the other armies. This condition is a progressive one, and in its later stages shows definite changes in the retina, sluggish pupils when tested by light, and a markedly contracted field of vision. Feigned cases of this disease can hardly be detected by relying on the absence of the retinal changes or the poor pupillary reaction, as these would be absent in the early cases which would be the ones most apt to be feigned, but it can be detected even in these early stages by a careful testing of the field of vision.

## DEFECTS OF HEARING

Fraudulent claims of bilateral deafness are seldom made, and here, once more, repeated examination for the amount of diminution of hearing, done with the eyes closed, if it reveals gross inconsistencies in the results obtained, will generally disclose the falseness of the claims. Feigning of marked bilateral deafness can usually be detected provided the claimant can be carefully observed for some time. A remark which is unacceptable to the person being examined made in a tone much lower than that necessary to make him admit he hears, may draw out an emphatic protest. Observation of the claimant which is not suspected by him also frequently results in proof that the hearing is much better than is claimed.

Unilateral deafness, like unilateral blindness, can be tested best by special methods. A loud ticking watch which the claimant admits he hears with the deaf ear may be heard at greatly varying distances when the eyes are closed, or not heard when at a point where it is heard when the eyes are open. Another method, and perhaps one of the simplest and most reliable, is to whisper a series of numbers into a mouth-piece attached to a rubber tube ending in an ear tip which can be inserted into the ear of the person to be examined. There are two of these tubes, and one is placed in each ear, and the ends with the mouth-pieces brought behind the back. Then the numbers are whispered, some into one tube and some into the other, while the patient repeats the numbers as heard. A careful record is kept of all the numbers spoken in order, and into which tube they were whispered, then if care is taken that the tubes are not moved, as they are being used, and the test consists of a sufficient number of figures, repeated fairly rapidly, one can usually detect the fraud if one is being practised.

## CONVULSIVE ATTACKS

Hysteric convulsions vary a great deal in character, and for some reason feigning of them is rare. This may be due in part to general ignorance of their characteristics, and in part because a hysteric convulsion is generally too long to be very successfully imitated. Where this is attempted careful observation by a person familiar with such attacks should leave no doubt of the fraud. Again hysteric convulsions are usually accompanied by other hysteric signs which would be difficult or impossible to feign successfully.

Epileptic attacks, on the contrary, are much more often simulated. Claimants for damages occasionally do this, but more frequently persons who hope to extract money from sympathetic bystanders or to obtain admission to a hospital. In the army where a man has been discharged from the service for epilepsy it is not uncommon to observe a small epidemic of somewhat similar attacks appear in the detachment or among his barrack companions. Then also among claimants for pensions, or compensation for disability, simulated epileptic attacks are not unknown. In all these simulated attacks the well-known characteristics of the epileptic attack are apt to be missing to a greater or less extent. The simulator, for example, is more apt to have his attack where it is likely to have spectators, or where it is likely to produce the results he wishes, as at the gates of the hospital, or in its admitting room. Then the simulator usually takes care to fall in such a way as not to injure himself, and one practically never sees cuts on the head or burns received because of the fall. The simulator does not bite the tongue severely, and the passing of urine or feces in the feigned attack is almost never seen. Then, too, as a rule the convulsive movements are not imitated well. The tonic stage with its cyanosis is too short, and the movements of the clonic stage are generally exaggerated or purposeful in character. Certain physical signs frequently found during an epileptic seizure or immediately after it cannot be feigned. Among these the most common are that during the epileptic attack the pupils are apt to be dilated, and become immobile to light, there are often twitching and nystagmoid movements of the eyes, and the tendon reflexes may be lost or much diminished, for a longer or shorter time after the seizure. A malingerer may at times be detected by his lack of insensibility to severe pain during the feigned unconscious period following the attack, such as the pain produced by strong pressure on the supra-orbital nerve, or by the application of a strong faradic current suddenly. In these tests for pain, as in some other tests, there is more danger of considering an hysteric attack as feigned than of being imposed upon by simulation. The administration of ether during the attack may aid in the detection of fraud. The epileptic when etherized passes into the relaxed unconscious state of full anesthesia with no phase of excitement, while the simulator may show the usual signs of cerebral excitement, laughing, talking, struggling to remove the ether cone, or similar things. Very strongly in favor of true epilepsy also is



the occurrence of an attack during profound sleep, though one must be careful to examine the evidence of this to guard against the possibility of the attack being feigned during a sleep that is also feigned.

## INCONTINENCE OF URINE

Absolute incontinence of urine from paralysis of the sphincter of the bladder can seldom be successfully simulated, especially if the person can be kept under close observation for a time. In organic cases the presence of areas of anesthesia or analgesia corresponding in distribution to the sacral spinal metameres, or the loss of tendon reflexes, or the presence of an Argyll-Robertson pupil, or other signs which cannot be feigned that indicate organic involvement of the nervous system should leave no doubt in the mind. This disturbance is most troublesome in the effort to rule out simulation in the case of soldiers. Among these nocturnal enuresis is fairly common, and is easy to feign, and because true nocturnal enuresis may be found in adults where there is no disease of the nervous system it is difficult to detect a fraud. There is no doubt that a good many young men, especially those who have had bed wetting persist rather long in childhood, when taken from civil life and placed where there is considerable exposure, as is almost inevitable in army life, and particularly in field service, may develop this trouble, and because of the ease of simulation it may become a very troublesome problem for the army surgeon. If a careful examination rules out disease of the bladder and prostate, as well as of the nervous system there still remains the functional irritability of the bladder to exclude. Various methods have been devised to discourage malingerers of this disease which eliminates certain ones. One method which frequently works well is to put these men to sleep in cots constructed with one bed over the other, letting them sleep alternately in the upper bed, when simulators are apt to give up the attempt to deceive. There is no doubt, however, that a good many men were discharged from our army during the World War for this trouble where no real difficulty existed. Perhaps in such cases where no organic disease exists it would be wise in time of war to refuse to discharge men for this trouble, and employ them at some base.

## FEIGNED PARALYSIS

Paralyses due to organic disease of the nervous system ordinarily presents little difficulty in recognition. Those due to destruction of the cerebral motor neuron show increase of reflexes and spasticity, and those from trouble in the peripheral motor neuron show atrophy of muscles, loss of the tendon reflexes and definite changes in the reaction of the muscles to electric currents. In addition, in most cases there are accompanying changes in the sensation that can hardly be successfully imitated as to the areas involved and other characteristics. Occasionally, however, simulation of paralysis is attempted and may succeed if the examination is not a careful one, or if the examiner is not

experienced in the various signs found in organic paralysis. Bailey recounts a case of this sort of simulation in the Freeman family, a mother and two daughters, who brought nine claims for injuries in two years. In one of these cases at the examination the fraud was exposed, as at one time the paralyzed leg was held in the air by the woman when the physician relaxed his hold, and the area of feigned loss of sensation did not correspond to that which would have been found in an injury of the spinal cord which was claimed, though in other respects the simulation was unusually well done.

The most difficult cases to differentiate from fraudulent ones are those where there is a hysteric paralysis. In hysteria we have a disease which is not feigned, but in which the paralysis is due to the loss of the voluntary control of the muscles by the will. Frequently we find as one would expect in a disease where the trouble is psychic in nature a loss of function, rather than a loss of all function in the muscles, as, for instance, that for walking, though the legs can be moved with good strength as the patient lies in bed, the condition called *astasia-abasia*. In this disease, as in feigned paralysis, we may find no changes in the sensation in the parts corresponding to that found in organic paralysis, but the disturbances of sensation if present are apt to represent a type that is well recognized as hysteric. For example, with a hysteric paraplegia there will be no disturbance of the control of the sphincters, and the loss of sensation may be for only one form of sensation, as that for pain, or extend only to the knees, as in the so-called stocking anesthesia, or affects one half of the body, while leaving that side of the face free from change. In short, the determination that a paralysis is hysteric and not feigned depends in part upon the picture conforming to that which we find in hysteria, and the finding of other definite hysteric symptoms, either bodily, like the contracted field of vision, or convulsions which are hysteric in character, or in the finding of some of the mental signs of hysteria, the loss of self-control, the suggestibility, or other characteristic stigmata.

### FEIGNED CONTRACTURES

Actual contractures, as a rule, are not difficult to make out, but now and then the differentiation of them from feigned trouble may be difficult. Where the loss of motion is due to trouble in the joint the freedom of the passive motion up to a definite point, with its sudden checking, and the information given by the *x-ray* examination of the bones will practically clear up most cases that are in doubt. It must not be forgotten, however, that early tubercular disease of joints limits motion by active muscular spasm, and not from the bony defect, and this may be mistaken for a voluntary contraction of the muscles, and the tubercular focus may not show in the *x-ray* till comparatively late in the progress of the disease. Examination of a contracture under ether, of course, simply proves that it is muscular if it disappears, and does not tell us whether this muscular contracture is due to tuberculosis

of the joint, or to hysteria, or to simulation. In tubercular joint disease the spasm is constant, starting very promptly with even slight motion, and the examiner cannot catch the muscles off guard, as is often the case in the other conditions mentioned. Simulated contractures are apt to increase under examination, and disappear if the subject is taken off guard, as by suddenly pushing the person so that the affected limb must be used to preserve the balance. Hysteric contractures like hysteric paralyses are best distinguished by searching for other signs of hysteria, and drawing our conclusions from the whole picture rather than to attempt to distinguish by any definite characteristic sign in the affected limb itself. However, one can often feel in a hysteric contracture that the muscles are actively resisting passive movements made in the direction in which the limb is being held, a phenomenon not seen in true contractures from organic disease, and this movement may be felt in muscles which appear to be paralyzed.

### FEIGNED INSANITY

Insanity is most frequently feigned by persons who have committed some serious crime, occasionally by others, such as by reporters in order to gain admission to a hospital for the insane, or by prisoners of war to obtain easier conditions, or in the hope of being exchanged.

If the simulator contents himself with an attempt to imitate a simple dementia, he may deceive even trained observers for a time. The more complicated picture of other forms of mental disease should be detected with comparative ease, in most cases, as the simulator almost always adds symptoms that are not seen in the form of insanity which is feigned, or leaves out important symptoms. For the detection of feigned insanity, however, repeated examinations are necessary as a rule, and sometimes fairly prolonged observation. The accurate investigation of the conduct of the suspected individual for the time preceding the apparent outbreak of the insanity is of great importance, as comparatively few attacks of these diseases begin suddenly. As a rule previous peculiarities of conduct have existed, although they may not have attracted especial attention. The maniacal patient has shown signs of depression preceding the violent outbreak, the person with dementia præcox has been peculiar, seclusive, brooding or suspicious, the person suffering from paresis has shown failure of judgment or changes of character, to say nothing of the physical signs which may be present, the rigid pupils, the slurring speech, or the changes found on examination of the spinal fluid, and the man with epileptic mania will probably have had the convulsive seizures.

A motive for feigning insanity should be considered only as a suspicious circumstance, indicating the need of careful individual study of the case. An imbecile confined with the insane may, for example, imitate some of the peculiarities of other patients, so that proved feigning of the symptoms of insanity does not necessarily prove that the individual is sane. So while one should not conclude that an insanity is



feigned because a motive for feigning exists, the converse may be considered true, that is, that an insanity for which we are certain no motive exists should not be suspected to be feigned. In cases where a crime has been committed insanity is seldom feigned before the deed has been performed, yet one should remember that this may be the case when the criminal knows that he is fairly sure to be suspected. Then, on the other hand, one should remember that the person who has committed a crime for which there is a real amnesia, as in cases of epileptic mania, cannot well claim innocence and a lack of knowledge of the crime until he has been accused. As a rule the simulator is worse and more violent when under observation, and when left to himself may be found to show no signs of mental or physical excitement, where that has been feigned, and to act in a natural way. In mania there is a very characteristic flight of ideas which is exceedingly difficult to imitate, and with it a motor excitement and restlessness which the imitator generally overdoes for a time, and then drops suddenly. The loss of flesh, which is very common in maniacal attacks, is rarely observed in simulators, nor can the continued insomnia be imitated easily. The simulator, wearied by his violent muscular exertions, as a rule sleeps soundly, and often the whole night through. In real depressed mental states we usually see also a definite loss of weight, which is generally absent in cases of feigned insanity. In fact, the man who feigns to be insane, especially if in confinement, is more apt to show a gain in weight than a loss. In these depressions, too, we are apt to find a marked insomnia when there is a true mental disorder. If paranoia be feigned there is not usually found the logical development of the delusions, the systematization of them, which is seen in the genuine cases, and the delusions are rather paraded with little or no occasion, unlike the genuine ones which patients are much more apt to conceal.

**Temporary amnesia** for a period of time in which a crime has been committed is always looked upon with suspicion, and justly so. Such amnesias for short periods of time are rare except after epileptic attacks or for the maniacal period following such a seizure, or from cerebral concussion. Rarely the maniacal period may appear in epilepsy with no preceding convulsion, or following a very short period of unconsciousness, in which the patient does not fall. In these rare cases one can generally learn of previous attacks which were similar, of petit mal attacks, or of occasional convulsions. A person who has committed a crime and is feigning amnesia for the period during which it was committed is very apt to show no signs of this amnesia immediately after the crime, and only subsequently claims to have no recollection of what has happened. If a partial amnesia is claimed the simulator usually says he recalls things which are trifling that happened during this time, and to have forgotten the more important ones, while the reverse is much more common where there is a genuine partial amnesia, where the act may be recalled, but not the events that preceded or followed it.

**Feigned vomiting** and other single symptoms can usually be

detected quite easily if the suspected person can be kept under observation for a time. The feigning of blood in the vomitus can be done in various ways, as by sucking the gums, or similar means, where, however, the quantity of blood is small, or by adding blood. The more recent tests for distinguishing human blood from that of animals, or the simple watching of these patients usually clears up any doubtful case of this sort in a short time. The same tests may be necessary where blood has been added to the urine, as happens now and again, sometimes among soldiers who desire hospital care, as a relief from duty, and at times by hysterics and others. The same methods of chemical and microscopic examination and of watching the suspected person will usually clear up doubtful cases of hemoptysis, and of recent years we have another very valuable test for the determination of early tuberculosis of the lungs in the examination by the *x*-ray, which often shows infiltrated areas so small that the customary physical examination leaves one in doubt.

**Feigned pregnancy** cannot possibly escape detection if an opportunity is given for a proper physical examination, and if that is refused, one may get very reliable evidence after the early months by means of the *x*-ray.

**Feigned headache** is perhaps the symptom which is most frequently met with, and perhaps the most difficult to detect, of any assumed symptom, as it is entirely subjective, and there are seldom any physical signs pointing to its existence, even if the person can be examined during the time when it is claimed to be present. Dilatation of the pupils upon pressure on the head as a sign of the aggravation of the pain helps at times if opportunity is afforded to make the test, but this may not be found even with severe headaches. Changes in the character or seat of the pain following suggestions made before the subject may enable one to unmask fraudulent claims of this sort, though here again one should remember that abnormal suggestibility is one of the most marked characteristics of hysteria. Perhaps the one thing which best justifies suspicions of fraud in cases of claims of headache is to get good evidence of repeated actions which are inconsistent with the existence of severe headache, which have been observed when the person claims to have the severe pain, but thinks himself unobserved.

Other symptoms are occasionally simulated, but in almost every instance this is so easy of detection where a careful examination has been made that they need not delay us. Such things as wry-neck, curvature of the spine, concussion of the brain, hemorrhoids, urinary calculi, sciatica arouse more wonder that impostors should try to imitate them, than difficulty in their detection when they are assumed, provided always that one has opportunity for a proper examination of the claimant, and most of these are more apt to come under the heading of substitution of causes when they are met.

# SUMMARIES OF STATE LAWS RELATING TO THE INSANE<sup>1</sup>

BY JOHN KOREN

REVISED BY

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## ALABAMA

### Authorities:

Code of Alabama, 1907  
Amendments of 1915

1. **Administration and Supervision.**—(a) *General.*—There is in Alabama no central administrative or supervisory board of charitable institutions. There is, however, a corporation under the name of "The Alabama Insane Hospitals" that manages and controls the two state hospitals for the insane and any other allied state institutions, such as those for the care and treatment of epileptics, feeble-minded, inebriates, and the like, that may at any time be confided to it by law.

The corporation, or board of trustees, consists of seven members, each member holding office for seven years. The governor is ex-officio the presiding officer of the board. Four of the trustees must be licensed physicians; three must reside near the Bryce Hospital; two, convenient to the Mount Vernon Hospital. They receive no salary, but are allowed their traveling expenses while on official business. Vacancies are filled by the board itself, subject to confirmation of the senate.

The board reviews and investigates the affairs of the hospitals and must annually prepare and transmit to the governor a full report of the wants, interests, conditions, receipts, and expenditures of the hospitals for the preceding fiscal year. It prepares a book of rules for the government and instruction of the employees of the hospitals.

For the immediate government and control of the hospitals the board of trustees elects a superintendent, who is the executive officer of the board, for a term of not less than eight years, and determines his salary. The superintendent may be removed from office by the board of trustees for just cause. The superintendent, subject to the approval of the trustees, appoints all the assistant physicians, stewards, managers, supervisors, nurses, and other employees of the hospitals. He has power to remove any of them from the employ of the hospitals at his discretion.

<sup>1</sup> We are indebted to the National Committee for Mental Hygiene, 50 Union Square, New York, for permission to publish this monograph.



(b) *Institutional*.—There are no local boards of trustees. Each hospital is under the direct supervision of an assistant superintendent, who is responsible to the general superintendent. (See (a) General.)

2. *Care*.—(a) *In State Institutions*.—The Bryce Hospital, Tuscaloosa; established 1860; 1800 beds. (For whites exclusively.)

The Mount Vernon Hospital, Mount Vernon; established 1902; 1000 beds. (For negroes exclusively.)

The criminal insane are received at both hospitals.

(b) *In Local Institutions*.—The court of county commissioners has the duty of supporting the poor of their county, including the insane who cannot be maintained at the state hospitals. The poorhouses in which the insane may be kept are under the management of the court of county commissioners.

3. *Commitment*.—(a) *Persons Committed*.—A person is defined as insane and therefore suitable for commitment to a state hospital if he has been found by a proper court deficient or defective mentally so that for his own or others' welfare his removal is required for restraint, care, and treatment.

The superintendent is authorized when the hospitals are crowded to accept only those patients that are offensively troublesome or dangerous to their own welfare and to decline those that are harmless or helpless. He may arrange with the probate judges to exchange harmless patients in the hospital for those that are dangerous.

(b) *Legal Procedure in Commitment*.—Application for the admission of a person to the insane hospital must be made to the judge of probate in the county in which the alleged insane person resides. If the judge of probate after due investigation finds the case a suitable one, he must make application to the superintendent for the admission of the patient, accompanying it with full and explicit answers to prescribed interrogatories concerning the patient. When informed by the superintendent that the person can be received as a patient, the judge of probate must call witnesses, at least one of whom must be a physician, and fully investigate the facts of the case, either with or without a jury, and either with or without the presence in the court of the person in question. If the judge or the jury believe the person is sufficiently defective mentally to be sent to a hospital for insane persons, the judge must make two copies of the certificate of the mental disqualifications, without which no person may be admitted, one of which is to be filed in his office, and the other to be sent with the patient to the hospital.

(c) *Voluntary Admission*.

(d) *Appeal from Commitment*.—At any time after an inquisition for guardianship the person ascertained to be of unsound mind, by himself, or by next friend, may apply in writing to the court of probate for a revocation of the proceedings, the application to be accompanied by the certificate of two physicians, or of two other competent persons, stating that after examination of such person, they believe him to be of sound mind. Not more than ten days thereafter a hearing must be held.

If the allegations of the application are denied, the court must summon a jury to try the case; and the same proceedings must be had as upon the original inquisition. If there is no contest, and the court is satisfied of the truth of the application, he must revoke the proceedings on the inquisition and the guardianship, and declare the ward restored to the custody and management of his estate.

If the verdict of the jury negatives the facts cited in the application, a judgment of dismissal, at the cost of the applicant, or next friend, must be entered.

Any person who is restrained of liberty under any pretense whatsoever may prosecute a writ of habeas corpus.

(e) *Cost of Commitment.*—The cost of commitment and of transportation to the hospital must be paid by the county treasury in the case of an indigent person.

4. **Conveying Patients to the Hospital.**—The judge of probate must require a relative, friend or officer, as he sees fit, to convey the patient to the hospital.

5. **Transfer of Patients.** 6. **Parole and Discharge of Patients.**—The superintendent may grant friends or relatives permission to remove from the hospital on trial at their expense any harmless patient whom he thinks it will benefit. Such a patient may be returned by friends or those in charge, but at the expiration of six months, if the patient has not been returned, he shall be regarded as discharged and readmission cannot be obtained with the same legal process as if the patient never had been admitted.

When a patient has been restored to a normal and comparatively safe and good mental condition sufficiently long to warrant the opinion by the superintendent that he ought to be returned to his home, or set at large again, the superintendent must inform the friends or relatives of the patient's recovery, and if they do not furnish the money to pay the traveling expenses, he must notify the judge of probate of the county, and the commissioners of the county then pay out of the county treasury the necessary expenses for the return of the patient to his home.

7. **Cost of Maintenance.**—The judge of probate must examine the financial standing of the person adjudged insane, and if he has not sufficient means to pay for his support at the hospital, it must be so stated in the certificate of admission and the expense is then borne by the state. When a patient or his parents or guardians possess means, or his relatives or friends care to provide for his support, the judge of probate must contract with responsible parties for the payment quarterly in advance of the amount chargeable for such patients, and cause a bond with sufficient surety to be made. The judge of probate from each county must from time to time at his own instance, if his attention is drawn to it by the superintendent or other person, investigate the financial standing of any indigent patient in the hospital from his county; and if he finds him able to pay for his support, he must, under penalty of having the patient returned at the county's expense to his home, contract with responsible parties for the payment in question.

The judge of probate can transfer a paying patient who has become indigent to the indigent class.

**8. Criminal Insane.**—No criminal or person indicted for crime, who has been declared insane, may be sent to an insane hospital until the sheriff or other officer having legal custody of said patient has forwarded to the superintendent an application and a description of the case, according to the form prescribed for judges of probate, together with a certified copy of the order of the court.

When any person sentenced to imprisonment in the penitentiary or to hard labor becomes insane, the physician in attendance must report the fact to the governor, who must appoint three suitable persons, one of them a physician, to examine the convict, and if they declare him insane and fit to be sent to the hospital, application must be directed for his admission. When any insane convict is brought to the hospital, instructions must always be given to whom his recovery is to be reported. Upon recovery of such a patient the proper officer must be notified and immediately remove him.

A death sentence may be suspended during the determination of the sanity of a convict.

## ALASKA

Authority:

Compiled Laws of Alaska, 1913

**1. Administration and Supervision.**—(a) *General.*—There is no general administrative board of charitable institutions. The legally adjudged insane of the territory are under the general supervision of the secretary of the department of the interior at Washington, D. C.

(b) *Institutional.*—The private sanitarium to which the insane and mentally defective of the territory are committed is visited and inspected at regular intervals and occasionally is subjected to special investigation by agents of the United States department of the interior. The detention hospitals at Fairbanks and Nome are under the control of the United States marshal of the district in which they are situated.

**2. Care.**—(a) *In Territorial Institutions.*—The territory has no hospital for the insane. The secretary of the interior receives bids for the care and custody of those adjudged insane and contracts at his discretion for their care with some hospital or sanitarium west of the Rocky Mountains. For several years Morningside Hospital, a private institution near Portland, Oregon, has cared for these patients.

(b) *In Local Institutions.*—At Fairbanks and Nome are detention hospitals for the care of the insane until they are transported to the States.

**3. Commitment.**—(a) *Persons Committed.*—Any legally adjudged insane person in the territory may be given care at the hospital with which the government has its contract.

(b) *Legal Procedure in Commitment.*—Complaint in writing may be made by any adult person that an insane person is at large. This complaint is made to a commissioner appointed by the judge of the district court to have probate jurisdiction. The commissioner has the



alleged insane person brought before him and tries the issue before a jury of six male adults. Some person must be appointed to represent the alleged insane person, and if a physician or surgeon is in the vicinity and can be procured he examines the patient and testifies. If the jury unanimously finds that the person charged is insane, the commissioner, if he approves the verdict, orders the insane person committed to the hospital for the insane.

(c) *Voluntary Admission.*

(d) *Appeal from Commitment.*—Every person imprisoned or restrained except by virtue of a judgment or execution is entitled to a writ of habeas corpus.

(e) *Cost of Commitment.*—All costs approved by the district judge are paid by the clerk of the court.

4. **Conveying Patients to the Hospital.**—The United States marshal of the district in which the proceedings are held conveys the patient to the hospital.

5. **Transfer of Patients.** 6. **Parole and Discharge of Patients.**—While the contract of the department of the interior with the hospital does not specifically provide for the release of persons on parole, it is the uniform practice of the department to parole Alaskan patients in the custody of their friends or relatives when their condition warrants, requiring the supplying of a satisfactory bond for the safe care and custody of the patient.

The patient is detained "until duly discharged by law," the government furnishing transportation and expenses back to Alaska for any patient discharged as cured.

7. **Cost of Maintenance.**—The cost of maintaining persons in the hospital and in the detention hospitals is met by appropriations made by Congress.

8. **Criminal Insane.**

## ARIZONA

Authorities:

Revised Statutes of Arizona, 1913

Laws of Arizona, 1917

1. **Administration and Supervision.**—(a) *General.*—The commission of state institutions is composed of three electors appointed by the governor, with the consent of the senate, and holding office at his pleasure. Not more than two members may be of the same political party. Each commissioner receives an annual salary of \$3000 and necessary traveling expenses, and must devote his entire time to the duties of his office and may not engage in any other occupation. The commission renders an annual report to the governor.

The commission has oversight and general control of all charitable, reformatory, penal, and other institutions established and maintained by the state. It employs a secretary at an annual salary of \$2400 and such other persons as may be needed. It prescribes uniform systems of records and accounts, and must keep in its office a complete record of all transactions at each of the institutions under

its jurisdiction. The entire commission must visit and inspect each institution at least once in six months and a member must visit and inspect each institution at least once in thirty days.

The commission appoints and discharges the chief officers of each of the state institutions. Except where appointed by the commission, the superintendent or chief executive officer of each state institution appoints and discharges all of his assistants, the number being determined by the commission. All salaries are fixed by the commission unless otherwise provided by law. The commission purchases all supplies for the state institutions, has charge of the erection of new buildings and of all repairs and improvements.

No member shall receive gift from an individual or firm with which the commission does business, nor shall a member or employee of the commission attempt to influence the political views of other members or employees or contribute anything for political purposes. The commission has the power to bring suit, to summon and examine witnesses and to compel the production and examination of books and papers; and any person failing to obey the orders of the commission in this connection shall be dealt with by the Superior Court as for contempt of court.

(b) *Institutional*.—There is no local board of trustees. The superintendent of the state hospital is appointed by the commission. He may, under the control of the commission, appoint all assistants and employees.

2. **Care**.—(a) *In State Institutions*.—Arizona State Hospital, Phoenix; established 1886; 500 beds.

(b) *In Local Institutions*.

3. **Commitment**.—(a) *Persons Committed*.—All insane persons are entitled to admission to the state hospital. Pay patients may be received under rates established by the commission of state institutions.

(b) *Legal Procedure in Commitment*.—The superior judge of any county, upon a sworn application that a person by reason of insanity is dangerous if at large, must cause the person to be brought before him for examination and summon two or more witnesses acquainted with the accused at the time of the alleged insanity. He must also call in one or more graduates of medicine and reputable practitioners to be present at the hearing, and after a personal examination of the accused to make a written statement under oath in regard to his mental condition, whether it is unsafe to let him go at large and whether his insanity is likely to prove permanent or only temporary. If the proofs satisfy the judge that the person is insane and cannot safely be allowed at large, he must direct the confinement of such person in the hospital for the insane until sufficiently restored to reason.

(c) *Voluntary Admission*.

(d) *Appeal from Commitment*.—Every person unlawfully committed or restrained of his liberty may prosecute a writ of habeas corpus to inquire into the cause of the restraint, by petition, signed either by the party for whose relief it is intended or by some person

in his behalf. Such writ may be granted by the supreme court or any district court.

(e) *Cost of Commitment.*—The cost of the commitment of an insane person must be borne by him if he has sufficient estate. If he is indigent, the cost is chargeable to the county from which he was sent.

4. **Conveying Patients to the Hospital.**—The board of supervisors of each county must cause insane persons to be conveyed to the hospital for the insane and provide meanwhile for their safe-keeping and care. The board of supervisors of counties are authorized, when necessary, to contract with the lowest responsible bidder for the transportation of insane persons of their counties to the hospital.

5. **Transfer of Patients.** 6. **Parole and Discharge of Patients.**—The superintendent has authority to release on parole patients not of a suicidal or homicidal tendency and who may be in a state of convalescence, upon application of their relatives or friends, who are required to give bond guaranteeing their proper care and maintenance and their return to the hospital if necessary, and to keep the superintendent informed each month of the mental and physical condition of the patients.

The commission of state institutions may by order discharge any patient who is not insane nor a proper case for treatment, under such regulations and rules as it may prescribe. Any poor and indigent patient discharged by the superintendent or upon the order of the commission because he is an idiot, an imbecile, not insane, or because he is not a proper case for treatment within the meaning of the law, must be returned to the care of the county from which he was committed. Every cured and discharged indigent patient must be furnished by the superintendent with \$5 in cash, a suit of clothes, and a half-fare ticket on any railroad or railway within the state.

Any person who has been declared insane, or the guardian, or any relative within the third degree, or any friend, may petition the probate judge of the county in which the person was declared insane, to have the fact of his restoration judicially determined. The judge must appoint a day for the hearing, and, if the petitioner request it, order the investigation before a jury, notice of the trial having been given to the guardian of the petitioner, to his or her husband or wife, and to his or her father or mother, if living in the country. The guardian or relative of the petitioner, and, in the discretion of the judge, any other person, may contest the right of the petitioner to the relief demanded. If the petitioner is found of sound mind and capable of taking care of himself and his property, his restoration to capacity must be declared, and the guardianship of such person, if he is not a minor, ceases.

7. **Cost of Maintenance.**—The probate judge may at any time inquire into the ability of any insane person committed by him to bear the expenses of his maintenance while in custody. If the insane person is able to pay the charges or any portion of them, the judge must appoint a guardian for him, authorized to control all his property, and to pay from the proceeds of it the cost of his maintenance. Indigent



insane persons are maintained at the hospital at the expense of the state.

**8. Criminal Insane.**—Whenever a person confined in any county jail in the state upon a conviction for a misdemeanor shows symptoms of insanity, the sheriff must immediately notify the county physician to examine the person, and, if in his judgment the person is insane, an examination into his insanity must be held as provided by law. If found insane the person must be committed to the hospital for the insane.

When a prisoner confined in the state prison shows symptoms of insanity, the prison physician must examine him and finding him insane, must report to the superintendent. The superintendent must communicate at once with the nearest legal authority having jurisdiction concerning persons alleged to be insane, and thereafter all proceedings must conform to the law governing such cases. If the person is found insane, the superintendent of the prison must send him at once to the hospital for the insane, at the cost of the state. The superintendent of the hospital must render, quarterly, to the superintendent of the prison a report of the condition of the person, and when he has so far recovered as to be able to continue service in the prison without further risk, he must be returned to serve any unexpired time. If his term of sentence has expired while in the hospital, the superintendent of the prison must forward him his legal discharge from the prison.

If, after judgment of death, there is good reason to suppose that the defendant has become insane, a jury of twelve persons may be summoned to inquire into the supposed insanity. The district attorney must attend the inquisition. If the defendant is found insane, the superintendent of the state prison must suspend the execution of the judgment until he receives a warrant from the judge of the court in which judgment was rendered, directing the execution of the judgment. If the defendant is found sane, the superintendent of the state hospital must immediately notify the governor, who must issue a warrant appointing a day for the execution of the judgment.

If doubt arises as to the sanity of a defendant in a criminal case, the court must order the question as to his sanity to be submitted to a jury. If the jury find the defendant insane, the trial or judgment must be suspended until he becomes sane, and the court must order that he be committed to the state hospital and detained there until he becomes sane. When he becomes sane, the defendant must be taken from the hospital and placed in proper custody until he is brought to trial or judgment or legally discharged.

## ARKANSAS

### Authorities:

Kirby and Castle, Digest of the Statutes of Arkansas, 1915  
Acts of 1917

**1. Administratin and Supervision.**—(a) *General.*—The board of control for state charitable institutions is composed of three members,

appointed by the governor and confirmed by the senate. Each member serves for six years, the terms being so arranged that an appointment is made to the board biennially. The annual salary of members, who are required to give full time to their official duties, is \$2500. The board appoints a secretary, who is required simply to be a bookkeeper and to keep a correct record of the proceedings. It reports to the governor biennially.

The board is placed in full charge of all state charitable institutions, which include the hospital for the insane, the school for the feeble-minded, the Confederate home, the school for the blind, and the deaf mute institute. It has no supervision over insane or feeble-minded persons in private institutions or in jails or other local institutions, nor does its power extend to the state or local penal or reformatory institutions.

The board appoints the superintendent and steward and purchases all supplies for the institutions over which it exercises control. The records of the board are open to the inspection of the governor and all persons whom he or the legislature may appoint to examine them. The board is required to visit the institutions under its control at least monthly.

The governor may at any time appoint a suitable person to examine the affairs of any institution.

(b) *Institutional*.—There is no local board of trustees. The superintendent, who is appointed by the board of control, must be a skilful physician. He appoints and removes all subordinate officers and employees allowed by the board. His duties in regard to records, accounts, and the general care of the institution and its inmates are prescribed in detail.

2. **Care**.—(a) *In State Institutions*.—State Hospital for Nervous Diseases, Little Rock; established 1882; 2050 beds.

The statutes require that negro patients shall be treated in separate wards or departments.

(b) *In Local Institutions*.—Each county must provide in the county poorhouse, where such has been established, for its own indigent insane who cannot be admitted to the state hospital, and the county court has the duty of looking after them. Insane persons may be confined in county or city jails. (Sec 3. b.)

3. **Commitment**.—(a) *Persons Committed*.—Any citizen or resident of the state who becomes insane may be admitted to the state hospital as a patient, proper proof having been made and proceedings had according to the law. All inmates of the Arkansas Confederate Home who become insane and have been declared so by the physician in charge are entitled to care and treatment in the state hospital.

All persons found to be insane, for whom application for admission to the state hospital is made, are classified as "acute," "chronic," "probably incurable," or "incurable." All cases of less than one year's duration from first recognized symptoms of insanity are classified as "acute"; all cases of over one year's duration as "chronic"; all cases complicated with epilepsy, original imbecility or feeble-mindedness,

deformities of skull from injuries, old age or paralysis as "probably incurable"; and all other cases as "incurable"; provided, that no person whether curable or not, and whether the imbecility or insanity be idiotic or congenital or not, may be refused admission as long as there is unoccupied room for patients in the hospital.

(b) *Legal Procedure in Commitment.*—Upon a written statement filed by any reputable citizen of the state with the county and probate judge alleging that any person is entitled to admission to the state hospital for the insane, the county or probate judge must appoint a time as soon as practicable to hear the testimony of witnesses, and must cause the insane person to be examined separately by two reputable, competent, and disinterested physicians, who shall severally present to the county judge a sworn statement of the result of their examinations. If the judge finds the person insane he must without delay transmit to the superintendent of the state hospital his decision in writing, with copies of the original statement filed with him by the citizen, and the statement of the physicians including interrogatories and answers. The superintendent of the state hospital must thereupon immediately notify the judge of his readiness to admit the insane person. If there is no room he must notify the judge, and return to him the documents in the case. But in such instances the name and county of the insane person must be recorded at the hospital in the order in which the decision of the judge was received, and he is entitled to precedence over all who may apply for admission later.

Insane persons found at large, and not in the care of some discreet person, must be arrested by any peace officer and taken before a magistrate of the county, city, or town in which the arrest is made, who shall make the necessary orders to keep him in restraint until he can be sent to the state hospital. If the insane person has no friends to whose custody the magistrate can commit him, he may order him to be confined in the county or city jail, giving immediate notice to the county judge or city attorney, whose duty it is to take the proper proceedings for having the insane person sent to the hospital.

Immediately after the appointment by the court of a guardian for an insane person, the guardian must take steps to have the person thus placed in his charge admitted into the state hospital.

If any person is so far disordered in his mind as to endanger his own person, or the person or property of others, his guardian, or other person under whose care he may be, must confine him in some suitable place until the next term of the probate court for his county, which shall make such order for his restraint, support, and safekeeping as the circumstances shall require. The judge or justice may order such confinement. Any judge of a court of record, or any two justices of the peace of the county may cause such insane person to be arrested, and may employ any person to confine him in some suitable place until the court makes further order.

(c) *Voluntary Admission.*

(d) *Appeal from Commitment.*



(e) *Cost of Commitment.*—Each county in the state is chargeable for all expenses of commitment, delivery to and removal from the state hospital of persons resident in the respective counties, and must reimburse the sheriff for money deposited with the superintendent for deficiencies of clothing of patients.

4. **Conveying Patients to the Hospital.**—The sheriff of any county, or any person deputized by the judge and directed to arrest and deliver to the superintendent of the state hospital any insane person, must execute the warrant or order without delay, and may call to his assistance a physician, nurse, or other person whom the judge may indicate as necessary, and shall deliver the person without unnecessary force, restraint, or publicity by the most direct and practicable route and method of travel. All females who have been adjudged insane must be accompanied to the state hospital by at least one female attendant.

5. **Transfer of Patients.**—The state board of control for charitable institutions may transfer to the school for the feeble-minded, with the consent of its superintendent, any feeble-minded inmates of the state hospital for nervous diseases as may be more appropriately taken care of in the school.

The superintendent of the state school for the feeble-minded may select and requisition from other state institutions such of their feeble-minded inmates as he considers most suitable for transfer, with due regard both to the welfare of the inmate and the benefit of the state.

6. **Parole and Discharge of Patients.**—The superintendent of a state hospital may parole for six months any patient not convicted under a criminal charge nor transferred from a penitentiary or reform school if the patient is harmless to himself and the community; on written application he may extend this parole for another six months. At the end of the twelve months the patient may be discharged as recovered or held for further treatment. A responsible person may agree to give the patient proper care during the parole period and return him to the hospital without expense to the county.

When there is no available room in the hospital the superintendent must, as soon as practicable, in order to make room for the admission of a patient suffering from an "acute" form of insanity, discharge some inmate belonging to the "incurable" class, if there is such, or one belonging to the "probably incurable" class if there is no one dischargeable from the "incurable" class, or one belonging to the "chronic" class if there is no one dischargeable from the "probably incurable" class. In making a selection for discharge the superintendent must choose one who has been longest in the hospital, if not violent or dangerous to the community, or whose discharge will effect the least possible inconvenience or cost. No appeal may be had from the decision of the superintendent in matters of admission and discharge of inmates, except to the board of control who may direct the superintendent to admit or discharge any person under any circumstances not involving a violation of law.

When by reason of recovery or necessity for the benefit of an insane

person of the "acute" class the superintendent of the state hospital thinks proper to discharge any inmate, he must notify the county and probate judge of the county from which the inmate was committed who shall then direct the removal of the inmate without delay to his guardian or home. If the patient has no guardian or home he must be delivered to such person and place in the county as may be provided for his further custody and maintenance, if he be not recovered and capable of taking care of himself. An inmate of the hospital having recovered his reason may unofficially be removed from the hospital by consent of the superintendent, or by his friends with consent of the superintendent, or by direction of the board of control. But notice of removal must be sent at once to the county or probate judge of the county from which the person was removed or committed.

**7. Cost of Maintenance.**—Any indigent citizen or resident of the state, duly found to be insane, may be maintained at the state hospital at the public expense until removed. If he has been found to possess estate more than sufficient for the support of his natural dependents, his guardian must pay for his maintenance and care at the hospital, and remove him when so required and notified by the president of the board of control and superintendent of the hospital. Indigent persons who are not able to pay have preference over those who are able to pay.

**8. Criminal Insane.**—The superintendent of the state hospital, upon the certificate of the judge before whom the case is pending upon presentment or indictment, must admit any person who has been acquitted upon a plea of insanity or any person who has been adjudged insane, when he has been held upon presentment or indictment and cannot be tried because of insanity. Any person so admitted must be kept at the hospital until restored to reason. Upon his recovery, the superintendent must notify the sheriff of the county in which the indictment or presentment is pending, who shall convey him back to the jail of said county, or hold him in custody until discharged according to law.

When the penitentiary physician ascertains that any convict confined in the state penitentiary or reform school is insane, he must certify the fact to the superintendent of the penitentiary or school who, by and with the advice and consent of the board of control, must transfer him to the state hospital. If the convict recovers, the superintendent must certify the fact to the superintendent of the penitentiary or school. The time the convict may have spent in the hospital is credited as time served under his sentence.

## CALIFORNIA

### Authorities:

Deering, General Laws of California, 1916  
Civil Code of California, 1915  
Penal Code of California, 1915  
Laws of California, 1917  
Political Code

**1. Administration and Supervision.**—(a) *General.*—The state board of control consists of three members appointed by the governor and

holding office at his pleasure. The governor designates the chairman and fills all vacancies; the board appoints its secretary and other paid employees. The members receive an annual salary of \$4000.

It is the duty of the board to examine the books of all state institutions, bureaus, commissions, and officers, to visit every public institution maintained in whole or in part by the state and all public buildings in course of construction. The board, with the consent of the governor, has the power to authorize the creation of deficiencies in cases of actual necessity; it also has the power to sell or exchange any property of the state, except real estate; and all claims against the state must be approved by it. The board has general supervision over all matters concerning the financial and business policies of the state, approves all state contracts for the purchase of supplies and materials, and, through its department of public accounting, maintains a uniform system of accounting and reporting for all public accounts and records. The board reports biennially to the legislature.

The state board of charities and corrections is composed of six members, not more than three of whom may be from the same political party, appointed by the governor for terms of twelve years without salary. Women may be appointed. The board must investigate and report upon all charitable and correctional institutions of the state, counties, cities, and towns. All persons in charge of such institutions are required to furnish the board such information and statistics as it may request. The board may prescribe the forms of reports and records by the state commission in lunacy. All plans for buildings for public institutions must be submitted to the board. The board has power to compel the attendance of witnesses, the production of books and papers, relating to public institutions. The board makes a biennial report to the governor.

A commission in lunacy, consisting of the general superintendent of the state hospitals, the secretary of the state board of health, the three members of the state board of control, and the governor, secretary of state, and attorney general, ex-officio, exercises general supervision over the state hospitals for the insane. The general superintendent of state hospitals is appointed by the governor for a term of four years, and may not hold any other office. His salary is \$5000. He must be a reputable physician, a graduate of an incorporated medical college, and have had at least ten years' actual practice in his profession as well as six years' experience in the care and treatment of the insane, at least one year of which must have been spent in the state hospitals. He must fully inspect every state hospital at least twice each year.

The commission is authorized, among other things, to appoint an accountant for the hospitals and to inquire into their general condition and management; to fix the annual salaries of the resident officers and treasurers of the hospitals, which must be uniform for all, and to classify other officers and employees and determine their salaries; to determine the kind and character of all employees in state hospitals. The commission must examine the condition and management of all public and



private institutions receiving and caring for the insane; adopt rules and regulations, books of record, blank forms, etc., for all hospitals; keep a record of each duly qualified medical examiner and of all inmates of hospitals; cause the books and accounts of the hospitals to be examined at least once in six months; report and recommend to the legislature the necessary prospective needs for the care and treatment of the poor and indigent insane; and, for the purpose of preventing overcrowding, make suitable recommendations to the legislature; furnish the legislature an estimate of the probable number of patients who will become inmates of the respective state hospitals during the two years beginning July first, next ensuing, and the cost of all additional buildings and equipments; and report to the legislature its acts and proceedings. The commission has power to investigate cases of alleged wrongful detention of insane or their improper treatment, and may for this purpose exercise the powers conferred upon the referee in a superior court. At an investigation into the general management of any hospital for the insane, the commission may notify the attorney general, who must participate personally or by a deputy. The commission may at any time visit and examine the inmates of any almshouse to ascertain if insane persons are kept there.

No private institution for the care and treatment of the insane may be established without first obtaining a license from the commission. Application for a license must be accompanied by plans and other information, in such form as the commission may require. Before granting a license, the commission must inspect the place and, after inquiry, amend or revoke any license. Private institutions for the care and treatment of the insane must keep records in the same manner and form as prescribed for the state hospitals. For violating the provisions of law in regard to private institutions for the insane, a penalty may be imposed of imprisonment for six months, or a fine of \$1000, or both.

(b) *Institutional*.—Each of the hospitals for the insane is under a board of five managers, appointed by the governor for terms of four years. Failure on the part of a manager to attend the regular meetings of his board unless ill or absent from the state makes his office vacant. Subject to the powers of the state commission in lunacy, each board of managers has general control and direction of the property and concerns of its hospital. Subject to the approval of the commission, the board must make laws and regulations in regard to the duties of officers and employees; visit the hospital at least every month (the attendance of the majority is required); and make detailed reports of visits and inspections to the commission in lunacy. No money may be expended by the managers for additional buildings or unusual repairs except upon plans and specifications approved by the commission.

Each board of managers appoints for the hospital under its control a medical superintendent (subject to an examination under the direction of the general superintendent) and a treasurer. The former must be a graduate of an incorporated medical college and a well-educated physician, who has had not less than three years' experience in the care and

treatment of the insane. The medical superintendent appoints, with power of removal, by and with the consent of the board of managers: a supervisor, matron and steward and all employees; the necessary assistant physicians and interns, as may be determined by the commission. At least one of the assistants in each of the state hospitals must be a woman. The assistant physicians must have had actual experience in the care and treatment of the insane, and before appointment are required to pass an examination conducted by the medical superintendent. Any officer or employee of a state hospital taking active part in politics, directly or indirectly, may be summarily removed by the commission upon written charges, under oath, made by three or more reputable citizens.

2. **Care.**—(a) *In State Institutions.*—Stockton State Hospital for the Insane, Stockton; established 1851; 1900 beds.

Napa State Hospital, Napa; established 1875; 2200 beds.

Agnews State Hospital, Agnew; established 1888; 1600 beds.

Mendocino State Hospital, Talmage; established 1893; 1150 beds.

Southern California State Hospital, Patton; established 1893; 2000 beds.

Norwalk State Hospital, Norwalk; established 1914; 233 beds.

(b) *In Local Institutions.*—Chronic harmless and other insane who are not suitable patients in the state hospital may be cared for in county hospitals or almshouses, which are under the boards of supervisors of the county.

The board of supervisors of each county, and city and county, must maintain a suitable room or rooms for the detention, care and treatment of alleged insane persons, for a period of not less than one nor more than twenty days.

All peace officers and other persons having duties relative to the insane poor must see to it that all poor and indigent insane persons within their municipalities are speedily granted relief, and when ordered by a superior judge must cause them to be transferred without unnecessary delay to the proper state hospitals.

3. **Commitment.**—(a) *Persons Committed.*—All insane persons are entitled to admission to the state hospitals for the insane; but no case of idiocy, imbecility, epilepsy, harmless chronic mental unsoundness, feeble-mindedness or acute mania from drinking may be committed to the state hospitals, except when the person has become insane.

The commission in lunacy may inquire into the manner in which any insane person not confined in a state hospital is cared for, and may apply to a judge of the superior court for commitment to a state hospital.

If a poor or indigent person who has not been a legal resident of the state for a period of at least one year, is ordered to be committed to a state hospital, the commission may return him to the country or state to which he belongs.

(b) *Legal Procedure in Commitment.*—The superior judge of each county, or city and county, may grant certificates to medical examiners in accordance with the form prescribed by the commission, showing that

the persons named are reputable physicians and graduates of incorporated medical colleges, and have been in actual practice at least five years. There must at all times be at least two such medical examiners in each county.

Whenever it appears by affidavit to the satisfaction of a magistrate of a county, or city and county, that any person is so far disordered in his mind as to endanger health, person or property, he must have him taken before a judge of the superior court of the county for a hearing. The copy of the affidavit and warrant of the arrest must be personally delivered to the alleged insane person. The judge of the superior court must inform him that he is charged with being insane and of his rights to make a defence, and order a time and place for a hearing of the case and examination in open court. The judge may also order that notice of the arrest and hearing be served upon relatives of said person residing in the county. At least two medical examiners must hear the testimony of all witnesses, make a personal examination of the alleged insane person, and testify before the judge as to the result of the examination, and to other pertinent facts. The judge must examine any other proper witness who has any knowledge of the mental or financial condition of the alleged insane person or financial condition of the persons liable for his maintenance. The alleged insane person must be present at the hearing, and if he has no attorney, the judge may appoint one to represent him. If the medical examiners believe the person to be dangerously insane, they must make a certificate to that effect in the form prescribed by law, whereupon the judge, if he believes the person so far disordered in his mind as to endanger health, person or property, must adjudge him insane and issue an order for his confinement in a hospital for the insane, accompanied by a statement as to the financial condition of the insane person or the persons liable for his maintenance. Copies of the order, the certificate of the examiners and accompanying statement must be filed with a county clerk and recorded by him. If a judge refuse to grant an order of commitment of an alleged insane person, any one aggrieved may demand a trial of the question in the manner provided for a jury trial.

Every superintendent of a hospital must within three days after the reception of a patient have him thoroughly examined physically and mentally. He must also make such examination periodically and state results upon blanks approved by the commission.

(c) *Voluntary Admission*.—Under rules and regulations established by the state commission in lunacy, the medical superintendent of any state hospital may receive and detain in such state hospital, as a boarder and patient, any suitable person suffering from mental disease, who voluntarily makes a written application to the medical superintendent for admission and who is competent to make such application. A voluntary patient may not be detained for more than seven days after having given notice in writing to the medical superintendent of his desire to leave. Upon the admission of a voluntary patient to a state hospital, the medical superintendent must immediately send the com-



mission in lunacy his record, showing name, residence, age, sex, nativity, occupation, civil condition, date of admission, and other information that may be required.

(d) *Appeal from Commitment.*—If a person ordered to be committed, or any friend in his behalf, is dissatisfied with the order committing him, he may within five days demand that the question of his sanity be tried by a jury before the superior court of the county in which he was committed. The cause against the alleged insane must be represented by the district attorney of the county. The trial is held as provided for the trial of civil causes before a jury, and the alleged insane person must be discharged unless a verdict that he is insane is found by at least three-fourths of the jury.

Any one in custody as insane is entitled to the writ of habeas corpus, upon proper application made by the commission, by such person, relative or friend in his behalf, to the superior judge of the county in which the hospital is located.

(e) *Cost of Commitment.*—The cost of determining the insanity of an indigent person and securing his commitment is charged upon the county, or city and county, whence he is committed. If he is not indigent, the costs are charged upon his estate, or to the persons legally liable for his maintenance. If he is adjudged not to be insane, the judge may charge the costs of the proceedings to the person making the application for an order of commitment. The husband, wife, father, mother, or children of an insane person, and the guardian of his estate, are liable for the cost and charges of his commitment and transportation to a hospital for the insane.

4. **Conveying Patients to the Hospital.**—It is the duty of the sheriff to deliver the insane person together with all documents in his case to the officer in charge of the hospital to which he is committed. No female insane person may be taken to any hospital without the attendance of some other female or of some relative.

5. **Transfer of Patients.**—When the buildings of any hospital are overcrowded or the number is reduced, the commission may transfer the inmates to other institutions. Patients may be transferred at the request of relatives or friends upon agreement to pay the cost of the transfer, if the lunacy commission and the superintendents of the hospitals consent. Inmates of the home for the feeble-minded who become insane may be transferred to a hospital for the insane and persons committed to an insane hospital who are feeble-minded may be transferred to the home for the feeble-minded by the board. The transfer may not relieve any one from liability for the support of any inmate.

6. **Parole and Discharge of Patients.**—The superintendent of a hospital may grant parole to a patient for not more than thirty days under provisions prescribed by the commission.

The superintendent of a state hospital on filing a certificate with the secretary or board of managers may discharge any patient, except one held upon a court order in a criminal action, who has recovered, or one not recovered whose discharge will not be detrimental to public welfare

or injurious to himself. The medical superintendent may refuse to discharge any patient as improved unless satisfied that proper care will be provided for him after his discharge. When the superintendent is unwilling to certify to the discharge of an unrecovered patient upon request, any superior judge of the county in which the hospital is situated may, after giving the superintendent an opportunity to be heard, direct the discharge upon such security as he may require for the good behavior and maintenance of the patient.

The medical superintendent of any state hospital may on his own motion, and must on the order of the commission, discharge any patient who is not insane or because he is not a proper case for treatment, or because he is an idiot, imbecile, or on account of chronic harmless mental unsoundness or acute mania from drinking. Such a person must be returned to the county from which he was committed at its expense, and if poor and indigent, must be cared for by the county. Any person thus discharged from a state hospital may not again be committed to any state hospital for the insane except upon permission obtained from the medical superintendent.

When any person committed to a state hospital, and for whom no guardian has been appointed, and who is absent on parole, or who has been discharged as improved, is desirous of being declared sane and restored to legal capacity, he or others on his behalf may make application in writing to the medical superintendent. If satisfied after examination that the person is sane, the medical superintendent must so declare him, and give him a certificate of his recovery, a copy of which is to be forwarded to the commission. If the medical superintendent is unwilling to issue such certificate, the insane person or others on his behalf may petition a judge of the superior court of the county wherein such person resides, asking that he be declared sane. If the court is satisfied, and the jury so decides, the court must adjudge him sane, and the order to that effect must be recorded by the county clerk and certified to the commissioners in lunacy and the proper hospital superintendent. If the court is satisfied, or the jury so decides, the court shall adjudge him to be insane. If the question is tried by a jury, the cause against the insane person must be represented by the district attorney of the county. An appeal may be taken from the decision of the court to the supreme court. If three-fourths of the jury fail to declare the person sane, or the court or jury find him insane, the court must dismiss the case and no new application shall be made for the insane person for six months thereafter. Proceedings of the same kind may be taken whenever a person who has been adjudged to be insane and who has not been committed to a hospital for the insane and who has no guardian, is desirous of being declared sane and restored to legal capacity. Before an order is made for any proceedings for a trial by jury, the persons demanding the same must make a deposit or give a bond for the payment of all costs of the trial, unless in the opinion of the court he is a poor or indigent person.

Patients discharged must be furnished with suitable clothing and money for necessary expenses, not exceeding \$25.

**7. Cost of Maintenance.**—Indigent insane persons are maintained at the state hospitals at the expense of the state. The district attorney in each county must inquire into the ability of a person committed from his county to pay for his support at the state hospital and notify the commission in lunacy of the results. In case any person committed to any state hospital for the insane becomes the owner of property, the secretary of the state commission in lunacy may apply to a court of competent jurisdiction for the appointment of a guardian of his estate, which if sufficient is to be used for his support at the hospital. Payment may be enforced by the order of the judge of the superior court. But payment may not be exacted when, in case of the likelihood of such person recovering or being released from the hospital, it will reduce his estate to such an extent that, in the event of his discharge, he is likely to become a burden upon the community.

Pay patients may be received under special agreement with relatives, guardians, or friends of patients.

**8. Criminal Insane.**—If a defendant in a criminal case appears to be insane before judgment is pronounced, the question of sanity is submitted to the jury. If found insane he is committed to a state hospital to remain till the superintendent notifies the sheriff and district attorney that the patient has recovered. The patient, upon certificate of recovery approved by the superior judge of the county from which he was committed, is then delivered to the sheriff of the county and dealt with as provided in the penal code. The time spent at the hospital counts as time served on the sentence.

When a defendant is acquitted on the ground of insanity the court may summon a jury to inquire whether the insanity continues. If it is so decided, he is committed to the state hospital.

When the warden of one of the state prisons and such other officers as may be designated by the directors of the same to act with him in such cases, believe any convict to be insane, after proper examination, the warden must certify the fact to the superintendent of one of the state hospitals for the insane, and send the convict to the hospital. If at the expiration of the term of sentence the insane convict is still in the hospital, he must be allowed to remain there until discharged as cured. When, in the opinion of the superintendent, the insane convict is cured of insanity, he must notify the directors of the prison and the warden who must receive the convict back into the prison, the time passed at the hospital counting as a part of his sentence. Before discharging a convict who may be insane at the time of the expiration of his sentence, the warden must notify a judge of the superior court of the county in which the prison is located of the fact of such insanity. The court must order the sheriff of the county to take the insane convict before the court. If satisfied after having him examined by medical experts that the convict is insane, the court must order him to be confined in one of the state hospitals.



## COLORADO

Authorities:

Mills' Annotated Statutes of Colorado, 1912

Session Laws of Colorado, 1915, 1917

1. **Administration and Supervision.**—(a) *General.*—The state board of charities and corrections consists of six persons appointed by the governor with the consent of the senate for a term of six years, two members retiring every two years. The governor is ex-officio a member of the board, and may remove any member of the board. Members of the board receive no compensation, but employ a salaried secretary.

The board has power to investigate the whole system of public charitable and correctional institutions which derive their support wholly or in part from state, county, or municipal appropriation. Officers of such institutions must furnish the board such information, statistical or otherwise, as may be demanded. The board must make a biennial report to the governor.

The state board of corrections, composed of three commissioners appointed by the governor for terms of six years, has full control, management, and supervision of the state hospital for the insane, the state penitentiary, and the state reformatory. Each commissioner receives \$1200 per annum and actual expenses.

The board of corrections has full control and supervision of all the property, grounds and buildings of the state hospital, and its entire government. It prescribes rules and by-laws for the management of the hospital and its inmates, and for the government of its officers and employees, and must make proper provision for the reception, treatment, discharge and transfer, either from or to other institutions or from the hospital to family care and the return therefrom, of all inmates who may be committed to the hospital.

The probate judges of the several counties appoint for terms of three years six persons, three of whom must be women, to constitute a county board of visitors.

Each board must visit at least once in three months all charitable or corrective institutions that are under county or municipal control and recommend necessary changes and improvements. Each board must file an annual report with the state board of charities and corrections.

(b) *Institutional.*—There are no local boards of trustees. The commissioners appoint a superintendent to hold office during their pleasure, who must be a physician, a graduate of an incorporated medical college, of at least five years' actual experience in a hospital for the treatment of the insane. The commissioners may provide for an assistant superintendent who must be a physician of at least five years' practice in his or her profession, two or more resident physicians, one of whom must be a woman, and for such other assistants and employees as may be necessary, and fix their respective salaries. All assistants and employees are selected and appointed by the superintendent, subject to the approval of the commissioners, and hold their positions subject to rules and regulations of the commissioners.

The hospital for the insane maintained by the city of Denver is under the control of the municipal authorities.

2. **Care.**—(a) *In State Institutions.*—Colorado State Hospital, Pueblo; established 1879; 1200 beds.

(b) *In Local Institutions.*—The city of Denver maintains a department for the insane connected with the city and county hospital. Insane persons who cannot be provided for in the state hospital may be maintained in county infirmaries, under the control of the board of county commissioners, the chairman of which is ex-officio overseer of the poor.

3. **Commitment.**—(a) *Persons Committed.*—The term “insane person” includes idiots, and any person so insane or distracted in his mind as to endanger his own person or property, or the person and property of others, if allowed to go at large. All persons adjudged insane are wards of the state. It is the duty of the board of corrections to admit them to the state hospital or provide and care for them elsewhere.

(b) *Legal Procedure in Commitment.*—Whenever a reputable person files with the county court a duly verified complaint alleging that any person in the county is so insane or distracted in his mind as to endanger his own person and property or the person and property of others, if allowed to go at large, the county court must have the patient taken into custody. If a sheriff or constable finds such an insane person at large in his county, he must apprehend him without an order of court.

To the insane person so arrested must be delivered a copy of the complaint and order. The judge issuing the order may designate a hospital or other convenient suitable place for detention until he shall determine whether an examination into the mental condition of the person is desirable. If apprehended without an order the insane person must be taken before the county court which determines forthwith whether an examination is desirable, but may order the person confined, observed, treated, and cared for temporarily.

The judge appoints a lunacy commission of two physicians resident in the county (if only one physician is available a layman may be substituted). No member of a lunacy commission shall be a relative of the person alleged to be insane, or a manager, superintendent, proprietor, officer, stockholder, or have any pecuniary interest, directly or indirectly, or be an attending physician, in the institution to which it is proposed to commit such person.

The commission examines the person in the presence of a guardian *ad litem* to be appointed by the court. Subpœnas must be issued to procure the attendance of witnesses desired by a commission, guardian, or county attorney. A lunacy commission has power to administer oaths and the right to examine witnesses whether they are subpœnaed or not. The commission must report within forty-eight hours of its first session, and notice of the presentation of report must be given to the board of county commissioners or county attorney. The judge must approve the findings and if the person is dangerous to be allowed at large, must commit him to the state hospital or other suitable place.

Every inquest in lunacy must be brought in the name of the people

of the state of Colorado, and be prosecuted by the county attorney of the respective county, or in case of his absence or inability, by a duly qualified attorney or other suitable person. No inquest may be had as to the lunacy of a person charged with a criminal offense until such criminal offense has been tried and dismissed unless the judge of the district court wherein the offense is pending shall order such inquest.

No insane person may be confined in any city or county jail unless he is violent and his absolute safety demands such confinement, and then only upon an order from the county court, under the penalty of a fine of \$10 to \$100 or imprisonment for 10 to 90 days, or both. Under no conditions may he be confined in any jail for a longer period than ten days.

A physician testifying to the insanity of any person for the purpose of securing his commitment to custody must be of reputable character, a graduate of some incorporated medical college, a permanent resident of the state, in the actual practice of his profession, and not connected with any institution for the insane. The possession of such qualifications must be certified by the judge of a court of record, and his certificate shall constitute such physician an examiner in lunacy. To act as medical examiner in lunacy cases without authority is punishable by a fine of \$50 to \$300 or imprisonment from 30 to 90 days, or both. This provision does not prevent the superintendent from testifying in lunacy cases.

(c) *Voluntary Admission*.—The superintendent of a hospital or other institution for the treatment of the insane may receive and detain as a patient any person who desires treatment and makes written application therefor, but whose mental condition is not such as to render it legal to grant a certificate of insanity in his case; but no patient may be detained more than three days after having given notice in writing of his intention or desire to leave. Voluntary patients must pay their cost of maintenance.

(d) *Appeal from Commitment*.—Any person ordered to be committed or any friend or any person interested in the proceedings may within five days after the order of the judge, demand in writing that the questions considered by the commission be tried by a jury of six men. At such trial the cause against the person complained of must be represented by the county or district attorney or by some one appointed by the county judge and the court shall appoint a guardian *ad litem* unless the patient appears by his own counsel.

A person, not committed or detained for any crime or supposed criminal matter, who is restrained of his liberty, may apply for a writ of habeas corpus to the circuit or district court. The application, signed by the party or some person on his behalf, must state the facts concerning his confinement and in whose custody he is detained.

Any county court or county judge in the state is authorized to issue the writ of habeas corpus in the absence of the circuit court or district court.

(e) *Cost of Commitment*.—Expenses attending any inquest in insanity are paid out of the estate of the insane by the conservator upon the



order of the county court, but if there is no estate, or if any original inquest results in discharge, the county commissioners of the proper county must allow them.

**4. Conveying Patients to the Hospital.**—The judge of the county court must designate some trained attendant to accompany the insane patient to the state hospital, and every female patient must be accompanied by a female attendant unless accompanied by her husband, father, brother, or son. This attendant shall have entire control of the patient until delivered to the place of commitment. The judge may make any other order relative to the persons to accompany the patient as to him seems proper.

**5. Transfer of Patients. 6. Parole and Discharge of Patients.**—The superintendent of the state hospital has the power to issue a probationary discharge if he believes it to be for the best interest of any patient under his control. When any person confined in the state hospital has been restored to reason, the superintendent must discharge him and notify the judge of the county court by which the patient was adjudged insane that the insane person has been restored to reason and discharged. Paupers when discharged must be furnished with a sum of money, clothing, and transportation to their homes.

If a reputable person presents to the county court of any county where a person is confined as an insane person, other than in the state hospital, an application in writing for his discharge on the ground that he has been restored to reason, the court must appoint two reputable physicians to make inquiry, and at least one of whom must not be officially connected with the institution where the patient is confined. If it is found that the patient has been restored to reason, he must immediately be set at liberty.

**7. Cost of Maintenance.**—If the commission reports that the person complained of has real or personal estate or if this fact comes to light at any time afterward, the court appoints a conservator, who applies the estate to the patient's maintenance. Relatives and next of kin are liable for a patient's support. If the patient has no estate, he is supported at the expense of the state.

Whenever any county expends any money in the necessary support, maintenance, or preserving in custody of any insane pauper, the county must be reimbursed from the fund for the support of the insane by the auditor of the state.

**8. Criminal Insane.**—There may be committed to the ward for criminal insane: dangerous persons who have committed high crimes or misdemeanors; persons charged with committing such crimes who are believed to feign insanity or in regard to whose insanity there may be so great a doubt so as to require the investigation of examiners; persons acquitted of such crimes on the ground of insanity; persons charged with the commission of any crimes who become insane before trial or sentence; persons becoming insane while in prison after conviction of any crime, and continuing insane throughout the term of sentence, who have no friends or relatives to whom they may be delivered at

the expiration of sentence; and insane convicts generally whose insanity has been ascertained, and who may be transferred from penal institutions.

Upon the recovery of any person who has been transferred from the state penitentiary or state reformatory to the state hospital, it is the duty of the superintendent of the hospital to notify the warden of the state penitentiary or state reformatory, who must transfer the person to the place of his former commitment for the purpose of serving out his sentence, if it has not expired.

## CONNECTICUT

### Authorities:

General Statutes of Connecticut, 1902

Public Acts of Connecticut, 1903, 1905, 1909, 1915, 1917

1. **Administration and Supervision.**—(a) *General.*—The state board of charities is composed of five members, two of whom are women, appointed by the governor for terms of four years, subject to removal by him for cause. The members receive no compensation for their services.

The board must meet at least once in two months. It must inspect all institutions in which persons are held under compulsion, to ascertain how they are treated and whether properly held and may correct any abuses found, through the persons in charge of the institutions. The state institutions must be visited once in three months by at least one member of the board of each sex. All hospitals for the insane must be visited and inspected at least once in six months. The board must appoint three supervisors of children in state institutions. The board reports annually to the governor and general assembly.

Private hospitals for the insane must be licensed by the governor. An application for license must show the proposed location, the number of persons for whom accommodations will be provided, and the previous experience of the applicant in the care and treatment of the insane. The physician in charge must be registered and have at least three years' experience as medical attendant in some institution for the insane. The license may be revoked by the governor upon proof that the institution is improperly conducted. The penalty for carrying on a private hospital in violation of law is a fine of not more than \$1000 or imprisonment for six months, or both.

(b) *Institutions.*—The state hospitals are under the immediate management of boards of trustees consisting of the governor and twelve trustees, appointed by the senate, one from each county and four from the vicinity of the hospital.

The trustees have charge of the general interests of the hospitals, appoint and remove all the officers and attendants, fix their compensation, and make rules and regulations for the conduct of the institutions.

The superintendent must be a competent physician and may be authorized by the trustees to admit patients under special arrangement when there are vacancies.

2. **Care.**—(a) *In State Institutions.*—Connecticut Hospital for the Insane, Middletown; established 1868; 2720 beds.

Norwich State Hospital for the Insane, Norwich; established 1903; 1230 beds.

Public patients are occasionally sent to the Hartford Retreat, a private institution, Hartford; established 1824; 165 beds. Such patients are maintained in part by the state, the major part of the cost of maintenance being paid by the towns in which they have a legal settlement.

The state prison has an insane ward for males, with a normal capacity of 40 beds.

(b) *In Local Institutions.*—There are no local public institutions for the insane.

The authorities in charge of almshouses must have all inmates examined by a physician at least once in six months and institute proceedings for the commitment of any insane persons found there. In case any town fails to institute such examination the state board of charities shall do so at the expense of the town.

3. **Commitment.**—(a) *Persons Committed.*—All insane persons who are residents of the state are entitled to admission to the state hospitals. Non-resident insane paupers may also be committed.

(b) *Legal Procedure in Commitment.*—The jurisdiction of the commitment of an insane person to a hospital is vested in the court of probate for the district in which the person resides, or in which he may be at the time of filing the complaint, except in cases where it is otherwise expressly provided by law. Courts of probate may exercise such jurisdiction only upon written complaint, which may be made by any person. If an insane person is at large and dangerous to the community, the selectmen of the town in which he resides or is at large, must make complaint. Except when otherwise specially provided by law, no person may be committed to a hospital for the insane without an order of a court of probate; except in cases of sudden and violent insanity, when he may be detained in a hospital for not more than forty-eight hours without special order of a court of probate, but proceedings must forthwith be commenced in that court.

Within ten days after a complaint has been filed, the probate court must appoint a hearing, giving due notice to the person alleged to be insane and to others concerned. The court may also cause the person complained of to be brought before it to see and examine him, if in its judgment his condition or conduct renders it necessary and proper so to do, or state in its final order why it was not necessary or advisable so to do. While the proceedings are pending the court may order the restraint of the alleged insane person. The court must require, in addition to any oral testimony, the sworn certificates of at least two reputable physicians, who are graduates of legally organized medical institutions and have been practitioners of medicine at least three years within the state, and are not connected with any asylum nor related to the complainant, nor to the person alleged to be insane. One of the



physicians is to be selected by the court. The certificate of the physicians must state that they have personally examined him within ten days of the hearing, and that in their opinion he is insane and a fit subject for confinement in a hospital. If the court finds that he is insane and a fit subject for treatment in a hospital, it must order his commitment to a hospital, to be confined while the insanity continues, or until discharged in due course of law.

When a pauper in any town is insane, a selectman of the town may apply to the court of probate for the district in which the pauper resides for his commitment to a state hospital for the insane, and the court must appoint two reputable physicians to investigate the facts of the case and report to the court. If they find the pauper insane, the court may commit him to one of the state hospitals for the insane.

When an indigent person not a pauper is insane, application may be made by any person or the selectmen in his behalf to the court of probate for the district in which he resides, and said court must appoint two reputable physicians, and a selectman of the town of the indigent person to investigate the facts and report to the court. The selectman must include in his report a statement of the facts relating to the residence of the person, and an estimate of the value of his estate so far as it can be ascertained. If the court of probate is satisfied that the person is indigent and insane and a resident of any town within its jurisdiction, it must order him to be taken to one of the state hospitals for the insane. The judge making the order of commitment must state the town of which the indigent insane person is a resident and the reported amount of his estate. No court of probate in this state may commit to an insane hospital within the state a person who is found by it not to be a resident of a town within the jurisdiction of the court.

Whenever a court orders the admission of a pauper or indigent person to a state hospital for the insane, it must record the order, and give a certified copy of it and of the proceedings to the person by whom the patient is to be taken to the hospital and transmit a copy to the governor. In case neither of the state hospitals for the insane can accommodate the person to be committed, the court may commit such person to another suitable asylum or hospital.

Any insane pauper, not a resident of any town in the state, may be committed by the governor to any suitable place of detention upon presentation of the sworn certificate of two physicians of recognized standing, that they have found upon examination that the person is insane; in case the commitment is to be made to a state institution, the certificate must be upon a form prescribed by the attorney-general. Any person who has suddenly become insane and is in need of treatment may, upon application and the certificate of a physician, be admitted to any hospital for the insane, public or private, for ten days. If further treatment is needed, the superintendent must apply for commitment.

(c) *Voluntary Admission*.—Any hospital may receive for observation and treatment any person who in writing requests to be received;

but no such person shall be confined in any hospital for more than ten days after he has given notice in writing of his desire to leave, without commitment from some court of competent jurisdiction.

(d) *Appeal from Commitment.*—Any person, relative, or friend has the right to appeal from the order of the court on behalf of any person found to be insane. The court of probate, on such appeal, must order notice given to the parties to the proceedings and to other persons as it may deem proper; and may require an appellant to give bond to pay all legal costs and expenses of the hearing if successful. On the trial of an appeal, the superior court may require the state's attorney to be present for the protection of the interests of the state and public. Pending an appeal to the superior court, it may make provisions for the care of the person complained of.

Any person committed or any person interested may apply to the court for a revocation of the order. The court must give notice to all parties concerned, hold a hearing, and determine the application.

All insane persons confined in any institution in the state are entitled to the benefit of the writ of habeas corpus, and the question of insanity must be determined by the court or judge issuing it. If the court decides that the person is insane, this decision is no bar to issuing such writ a second time, if it is claimed that the person has been restored to reason.

On information that any person is unjustly confined in any insane hospital, or in any neighborhood hospital in this state, or in the custody of any individual under an order of a court of probate, any judge of the superior court may appoint a commission of not less than two persons to inquire into the case. If in their opinion the person is not legally detained, or is cured, or his confinement is no longer beneficial or advisable, the judge must order his discharge; but no commission may be appointed with reference to the same person oftener than once in six months. The judge before whom the proceedings are had may tax reasonable costs at his discretion.

(e) *Cost of Commitment.*—All fees and expenses incurred by commitment proceedings must be paid out of the estate of the person found insane, if he has sufficient estate, and, if not, by his relatives liable to support him, if of sufficient ability, and if there are none such, then by the town to which he belongs. In case the person is found not to be insane, the fees and expenses must be paid by the complainant.

**4. Conveying Patients to the Hospital.**—State hospitals and other hospitals for the insane must, if possible, when requested by an officer of the court, send properly trained attendants or nurses to attend any hearing concerning the commitment of an insane person, and such attendant or nurse when present must be designated by the court as the authority to serve the commitment. If no other attendant is appointed by the court, the selectmen of the town must provide for the conveyance of the patient to the hospital.

In appointing a person to convey the insane patient to the hospital, the court must give preference to a near relative or friend of

the insane. Unless a female patient is in charge of a member of her own family, the court must direct that at least one adult female shall accompany her.

**5. Transfer of Patients.**—The governor may at any time cause an inmate to be transferred from one state hospital to another as circumstances, in his judgment, may require.

Any inmate of any institution for the feeble-minded, epileptic, or insane may be transferred to any other institution by the court making the original commitment. The institution from which the transfer is made must pay all of the costs.

**6. Parole and Discharge of Patients.**—The superintendent of any institution for the insane may, under such restrictions or agreements as he deems proper, permit any inmate to leave the institution temporarily, in charge of his guardian, relatives, friends, or by himself, for a period of time not exceeding six months. The original order of commitment remains in force and effective until the patient is officially discharged by the authorities of the institution. He may be returned by his guardian, relatives, or friends, or by himself, or may be recalled by the authorities of the institution at any time during the six months. The expense, if any, of such recall or return is, in the case of an indigent, to be paid by those responsible for his support, or, in the case of pauper, by the town of which he is a resident.

The officers, directors, or trustees of a state hospital when notified by the superintendent that a patient is not insane or a proper subject for confinement may petition the superior court to order his discharge. A copy of the petition shall be served upon the selectmen of the town to which the person belongs. If of the opinion that the patient is not legally detained or cured or no longer benefited by confinement, the judge shall order his discharge or direct other disposition.

Any person held in confinement as an insane person under the order of a court of probate may, upon proper application and satisfactory proof that he has been restored to reason, be ordered discharged by such court.

**7. Cost of Maintenance.**—In the case of an insane pauper, the town whose selectman applied for commitment must pay \$2 per week for his support at the hospital, the balance being paid by the state. In the case of an indigent person not a pauper, the person making the application must pay a reasonable amount for his support, the balance being paid by the state. Provision is made for the recovery by a town from a person liable for the support of a patient or from any town to which a person is chargeable.

The support of insane paupers who are not residents of any town in the state (who may be committed by the governor to any suitable place of detention) is paid by the state to an amount not exceeding \$3.75 per week.

**8. Criminal Insane.**—When a person committed for trial to the county jail appears to be insane, a judge of the superior court on application of the sheriff may appoint three physicians to examine him; and



if the physicians find him insane, the sheriff must, upon the order of the judge, transfer him to the Connecticut Hospital for the Insane at Middletown, until the time of his trial.

Any superior court, criminal court of common pleas, city court, or police court, before whom any person is tried on criminal charge, and acquitted on the ground of insanity, may order him to be confined in the Connecticut Hospital for the Insane for such time as the court shall direct, unless some person undertakes under bond to the state to confine him in such manner as the court may order.

Any person tried on any criminal charge who has been acquitted on the ground of insanity or dementia, and confined in the Connecticut Hospital for the Insane, may petition, or the officers of the institution may petition, the superior court of the county in which he is confined for his discharge. The petition must be served like civil process on the selectmen of the town to which he belongs, and upon the person, if any, upon whom the offense was charged to have been committed, and upon the state's attorney of the county in which the trial was had. The state's attorney must represent the state on the application.

When a person, tried on any criminal charge and acquitted on the ground of insanity, has been confined in a hospital for the insane for a specified term, and is found still to be suffering from insanity at the expiration of the term, the superintendent of the hospital must certify the facts to the state's attorney for the county wherein the trial was had, who must procure from the court an order for the confinement of the person in the hospital until his recovery.

When in the opinion of the jailer of any common jail, a prisoner appears to be insane, he must immediately report the fact to the governor, who shall appoint a commission of not more than three experts to examine the prisoner. If the commission find the prisoner insane, the governor, having approved its report, must order him committed to the Connecticut Hospital for the Insane until the expiration of the term for which he was committed, or until he has recovered from his insanity. If the prisoner has recovered his reason before the expiration of the term for which he was committed, the superintendent of the hospital must report the fact to the governor, who shall appoint a commission to examine into his sanity; and if he has ceased to be insane, the governor must order his return to the jail.

When a convict, transferred from a county jail to the Connecticut Hospital for the Insane, is confined as insane, at the time of the expiration of the term of imprisonment for which he was committed the superintendent must certify the facts to the governor, who may order the detention of the person until he has recovered from his insanity.

A male convict in the state prison becoming insane is cared for in the insane ward of the prison; a female, on certification by the physician and consulting physician of the prison, is reported to the governor, who orders her removed to a state hospital. When an insane male convict has finished his sentence, he is discharged from the prison into the custody of the Connecticut Prison Association, which arranges for

the prisoner's commitment to the state hospital, if in its judgment further confinement is necessary.

## DELAWARE

### Authorities:

Revised Code of Delaware, 1915

Laws of 1915, 1917

**1. Administration and Supervision.**—(a) *General.*—The board of supervisors of state institutions consists of the governor and two residents of the state who are appointed and removed by the governor. They serve for four years and receive \$100 per annum for expenses. The supervisors must visit at least once in three months all the state and other institutions within the state to which the state appropriates money and may investigate all matters relating to the conduct of the institutions and make any suggestions or changes in the control of patients as they may deem proper and necessary. Any complaint of cruel, barbarous, or unfair treatment made by an inmate of an institution wherein persons are deprived of their liberty must be fully investigated, and if it is well founded, the board must prepare and present the person's charges against the one at fault to the board of managers or the trustees of the institution. The supervisors must examine carefully into the financial arrangements of the institutions, the purchase of supplies, and disposition of funds, and make recommendations to boards of trustees or managers. They must submit a statement to the governor at any time on his request and a full report biennially to the legislature.

(b) *Institutional.*—The state hospital for the insane is under the management of a board of trustees of nine members, three from each county, who are appointed by the governor for terms of three years. One trustee from each county must be a physician in good standing. More than one political faith must be represented from each county.

The board of trustees has sole and complete control and management of the Delaware state hospital at Farnhurst, appoints physicians, stewards, matrons, nurses and all other necessary servants, and fixes their terms of service as well as their pay; provides suitable food, raiment, medicine, and all other things necessary for the comfort and improvement of the hospital. Each member receives a fee and compensation for attending board meetings. The board is prohibited from doing or contracting for any construction or erection of buildings.

**2. Care.**—(a) *In State Institutions.*—Delaware State Hospital, Farnhurst; established 1889; 500 beds. There are separate wards for white and colored patients.

(b) *In Local Institutions.*

**3. Commitment.**—(a) *Persons Committed.*—All indigent insane persons must be admitted to the hospital upon the written order of one of the board of trustees. The board of trustees may also receive insane patients from other states who are able to pay for their maintenance and support. Insane who are residents of the state may be received as

pay-patients. The commitment of any person does not raise any presumption against his sanity.

(b) *Legal Procedure in Commitment.*—Before a patient can be received at the hospital a certificate must be filed with the superintendent, made and sworn to by at least two physicians, residents of this state, who have been actively engaged in practice in the same state and county as that in which alleged insane person resides. The certificate must state that the physicians have separately examined the person, that they believe that his disease requires hospital care and treatment; and that they are in no way related by blood to or connected by marriage with him, nor in any way connected with the hospital. The commitment papers of any inmate of the New Castle county almshouse must be signed by at least one of the physicians required by law to examine patients committed from the city of Wilmington. The certificate must be made within one week after the examination of the person, and within two weeks of the time of the application for admission to the hospital. The certificate must be signed by the physicians and the signatures must be certified as genuine by an officer authorized to administer oaths, before whom the physicians must make an affidavit as to the truthfulness of the facts. In all cases the certificate and other papers must be accompanied by an order of admission, signed by one or more of the trustees of said hospital. Commitments to the hospital made by the chancellor, or any court of the state, as provided by law, are exempt from the above provisions.

The state board of trustees of the state hospital are required to appoint two physicians, of different schools of medicine, residing in the city of Wilmington, for a term of three years. No person may be admitted to the state hospital upon the certificate of any physician living in the city of Wilmington, unless it is signed by at least one of the physicians appointed by the state board of trustees. Otherwise, the admission of patients to the state hospital is in conformity with the preceding paragraph.

(c) *Voluntary Admission.*

(d) *Appeal from Commitment.*—A person committed to the state hospital or any person related to the person committed within the third degree of consanguinity or any other three persons may present a sworn petition to the chancellor at any time stating that they believe him to be sane and asking for a writ to the sheriff of the county to determine whether he is a sane or an insane person. The chancellor must then issue a writ *de lunatico inquirendo* to the sheriff, commanding him within five days after the service to summon a jury to determine the case, and return the findings by the jury to the chancellor within two days. If the jury finds the person sane, the sheriff must send an order to the superintendent of the hospital for the release of the person.

(e) *Cost of Commitment.*—The expenses of the examination of an indigent insane person and of his removal to the state hospital must be paid by the county of which he is a resident.



4. **Conveying Patients to the Hospital.** 5. **Transfer of Patients.** 6. **Parole and Discharge of Patients.**—The superintendent has authority to discharge an indigent patient who has recovered or who no longer needs residence in the hospital, provided he notifies the trustees of the poor of the county from which the person was committed of his intention.

Without regard to the length of time a person has been committed, a patient may be discharged as provided under 3 (d), Appeal from Commitment.

7. **Cost of Maintenance.**—Indigent insane are supported at the cost of the state. When an insane person is able to support himself, the state board of trustees has authority to collect the necessary money out of his property, after reasonable provision is made for the maintenance and education of his family. The expense of caring for a criminal insane person is paid by the trustees of the poor of the county of his residence or in which the criminal act was committed.

The board of trustees may make contracts in relation to the board and maintenance, care and custody of any insane resident of the state, and may recover from the person contracted with, or from the patient himself, the compensation agreed upon, or a reasonable compensation.

8. **Criminal Insane.**—If, at the trial of a person on an indictment, the defense of insanity is established to the satisfaction of the jury, it must return a verdict of "not guilty by reason of insanity." The court may thereupon order the person committed to the state hospital. The expenses of the removal of such insane person, and of his support at the hospital or institution, must be paid by the trustees of the poor of the county where the act charged was committed, or of the county of the insane person's residence. The court of general sessions may order an insane person, acquitted as above, set at large if satisfied that the public safety will not be endangered, or may order his removal from any hospital to the almshouse of the county where he resided at the time of the commission of the act charged, or county where the act was committed.

If in a capital case the prisoner becomes insane after conviction and before sentence, the court has power to appoint a commission, two at least of whom shall be practicing physicians, to inquire into the mental condition of the prisoner and make a report to the court. If the commission find the prisoner insane, he must be remanded to the custody of the sheriff until the further order of the court. Should he recover his reason after such remand, he must receive the sentence appointed for his crime. Whether the prisoner has recovered his reason may be established to the court by any evidence it may choose to consider for that purpose, and need not be by commission.

## DISTRICT OF COLUMBIA

## Authorities:

Revised Statutes of the United States

Code of Laws for the District of Columbia, 1911

1. **Administration and Supervision.**—(a) *General.*—The board of charities of the District of Columbia has power, under the order of the district commissioners, to investigate and report upon the government hospital for the insane in common with other charitable institutions of the district.

(b) *Institutional.*—Nine citizens of the district, appointed by the President, constitute the board of visitors of the hospital. The board of visitors, whose members serve without compensation, may, subject to the approval of the secretary of the interior, make any needful by-laws concerning the superintendent, his employees, and the patients. The board is required to visit the hospital at stated periods, exercises a careful supervision over its expenditures, and makes an annual report to the secretary of the interior.

The superintendent of the hospital is appointed by the secretary of the interior.

2. **Care.**—(a) *In Federal Institutions.*—St. Elizabeth's Hospital, Washington (Anacostia); established 1855; 3000 beds.

(b) *In Local Institutions.*—There are no institutions for the insane maintained by the district. The Washington asylum hospital has a psychopathic ward.

3. **Commitment.**—(a) *Persons Committed.*—1. Insane persons belonging to the army, navy, marine corps, and revenue-cutter service.

2. Civilians employed in the quartermaster's pay and subsistence department of the army.

3. Men who, while in the service of the United States in the army, navy, or marine corps, have been admitted to the hospital and subsequently discharged, but who within three years after such discharge become insane from causes existing at the time of such discharge, and have no adequate means of support.

4. Indigent persons who have been in either of the services mentioned and discharged therefrom on account of disability arising from insanity.

5. Indigent persons who become insane within three years after their discharge from such service from causes which arose during and were produced by the service.

6. Inmates of the national soldiers' home.

7. All persons who having been charged with offenses against the United States are in the custody of its officers, and all persons who shall have been convicted of any offense in any court in the district and imprisoned in any state prison or penitentiary, and who during their term of imprisonment have become insane.

8. Insane criminals and persons charged with crime in the courts of the district.

9. Indigent insane who are residents of the district (non-residents of the same class are admitted only for temporary care).

10. Beneficiaries of the United States public health service.

11. Private pay patients from the district who may be received at the hospital whenever there are vacancies.

(b) *Legal Procedure in Commitment*.—Proceedings are instituted upon petition of the commissioners of the district to determine the mental condition of alleged indigent insane residents of the district and persons alleged to be insane with homicidal or otherwise dangerous tendencies. All writs *de lunatico inquirendo* issue from the equity court, and the justice holding such court presides at all inquisitions of lunacy, and when necessary may call a jury from either the circuit or the criminal court, or may summon a special jury for such inquisitions.

An insane person within the district may be apprehended and restrained without warrant by any member of the metropolitan police or any other official in the district authorized to make arrests. He must at once file an affidavit with the superintendent of the metropolitan police that he believes the person in question to be insane, incapable of taking care of himself and his property, and dangerous to the public. Some near relative or friend of the person in the district must immediately be notified.

The superintendent of the metropolitan police is authorized to order the apprehension and detention without warrant of any indigent person alleged to be insane or who has homicidal or dangerous tendencies and found elsewhere than in public places, upon the affidavits of two or more responsible residents, which must state that they believe the person to be insane, the length of time they have known him, and that they believe him to be incapable of managing his own affairs and dangerous to the public, if allowed to go at liberty. But before the apprehension is ordered, the superintendent of the metropolitan police must require the certificate of at least two physicians who shall certify that they have examined the person alleged to be insane and that he should not be allowed to remain at liberty, and that he is a fit subject for treatment.

The commissioners of the district are authorized to place in the government hospital for the insane for a period not exceeding thirty days, indigent persons alleged to be insane residents of or found within the district, and alleged insane persons of homicidal or otherwise dangerous tendencies apprehended and restrained as provided above, pending their formal commitment to the hospital or their transportation to their homes when their places of residence are ascertained. The commissioners may, pending their temporary commitment or formal commitment to the government or to any other hospital for the insane, authorize the temporary commitment of the above named insane persons for a period not exceeding thirty days to any other hospital in the district, which in the judgment of the health officer of the district is properly equipped for the care of such persons. Such a person may be detained in any police station or house of detention



pending arrangements for his temporary detention in the government hospital or other institution; or they may be detained there until formally committed, in case no other provisions are feasible.

No certificate as to the sanity or insanity of any person is valid if made by a physician who has not been regularly licensed to practice medicine in the district, unless he be a commissioned surgeon of the United States navy, army, or public health service; or by a physician who is not a permanent resident of the district; or by a physician who has not been actually engaged in the practice of his profession for at least three years; or by a physician who is related by blood or marriage to the person whose mental condition is in question; or if made by a physician who is financially interested in the hospital in which the alleged insane person is to be confined, or who is officially connected with it. The penalty of a fine of not more than \$500, or imprisonment for not more than three years, or both, is provided for making an affidavit without proper cause for the purpose of securing the detention or restraint of any person in the district or for knowingly making a false certificate.

In case any person adjudged to be of unsound mind has property, real or personal, the equity court has full power to appoint a committee or trustee of the person and of his estate, who must reimburse the district out of the funds of the person for all costs expended or incurred by it, both before and after the time of such appointment.

The equity court has full power to superintend and direct the affairs of persons *non compos mentis*, and to appoint a committee or trustees for such persons after hearing their nearest relatives, if residing within the jurisdiction of the court, and to make such orders for the care of their persons and the management and preservation of their estates, including the collection, sale, exchange, and reinvestment of their personal estate, as to the court may seem proper.

The commissioners of the district must, as soon as practicable, return to their places of residence or to their friends all indigent insane persons not residing in the district at the time they became insane who are detained in the government hospital for the insane, or who are committed to it temporarily. All necessary expenses incurred by the commissioners in ascertaining the residence of such persons or of their friends, and in returning them, are paid by the district.

(c) *Voluntary Admission.*

(d) *Appeal from Commitment.*—Any person restrained of his lawful liberty within the district, under any pretence whatever, or any person in his behalf, may apply by petition to the circuit court of the district for a writ of habeas corpus, to have the cause of the restraint inquired into.

(e) *Cost of Commitment.*—All expenses incurred by the commitment of an insane person are chargeable to the district unless the person has an estate, in which case he is liable for them.

4. **Conveying Patients to the Hospital.** 5. **Transfer of Patients.**  
6. **Parole and Discharge of Patients.**—Authority to discharge patients

is vested in the superintendent. When a patient committed to the government hospital for the insane, or any other institution, recovers his reason and is discharged as cured, the superintendent of the government hospital for the insane, or the official in charge of any such other institution where such person has been under treatment, must immediately file with the clerk of the supreme court of the district his sworn statement that the person, in his opinion, was at the time of his discharge of sound mind, and this statement shall be sufficient to authorize the court to pass an order declaring the person restored to his former legal status as a person of sound mind.

If the superintendent of the government hospital for the insane, in the case of commitment to it, or if two or more physicians in regular attendance at any other hospital to which a person has been committed for temporary care, or if two or more persons in the police or fire departments when a person is detained at the police station, certify in writing to the physicians of the hospitals in the district, that the person is not insane or has recovered his reason, the officials in question must at once discharge the alleged insane person and report their action to the commissioners of the district.

**7. Cost of Maintenance.**—One-half of the cost of support in the hospital of indigent insane from the district is paid out of the revenues of the district and the other half from the treasury of the United States. Patients from the army, navy, marine corps, etc., are supported wholly at federal expense.

The district pays to the federal hospital the entire cost of all district non-indigent civilian patients, and then seeks reimbursement in whole or in part from their personal estate or from the immediate family or friends of the patient.

**8. Criminal Insane.**—When a person tried upon an indictment or information is acquitted on the sole ground that he was insane at the time of the offense, the jury must so state in their verdict. When a person is indicted or charged by an information for an offense, and before trial or after a verdict of guilty, prima facie evidence is submitted that the accused is insane, the court may summon a jury to make inquiry into the insanity of the accused in the presence and under the direction of the court. If the jury finds the accused insane, or if he is acquitted solely on the ground of insanity, the court may certify the fact to the secretary of the interior, who may order him confined in the hospital for the insane, the person and his estate being chargeable with his support in the hospital. The person whose sanity is in question is entitled to a bill of exceptions and an appeal as in other cases.

Any person becoming insane while undergoing sentence of any court of the district for crime may be committed to the hospital for the insane by order of the secretary of the interior, to receive the same treatment as other patients during the continuance of his disorder.

When a person confined in the hospital for the insane, who is charged with crime and subject to be tried or undergo sentence, is

restored to sanity, the superintendent of the hospital must give notice to the justice holding the criminal court and deliver him to the court.

## FLORIDA

### Authorities:

Constitution of the State of Florida

Compiled Laws of Florida, 1914

1. **Administration and Supervision.**—(a) *General.*—The board of commissioners of state institutions, consisting of the governor and the six administrative officers of the executive department, all elected by the people every four years, has complete control and management of the state hospital for the insane, state penal institution, reform schools for boys and for girls, blind, deaf and dumb institute, and supervises the county chain gangs. A secretary is appointed by the board but he is not a member of it.

The board employs the superintendent, physicians, medical attendants, and other persons necessary for the proper management and care of the insane, and of the hospital and the properties belonging to it; it prescribes the powers and duties of the superintendent and of all the other employees, and requires of the superintendent a bond with sureties.

There is a state board of control, but it has no jurisdiction over the state insane hospital, its supervision being only over the state educational institutions.

(b) *Institutional.*—There are no local boards of trustees.

2. **Care.**—(a) *In State Institutions.*—Florida Hospital for the Insane, Chattahoochee; established, 1877; 1500 beds. There are separate accommodations for white and negro patients.

(b) *In Local Institutions.*—Incurable, harmless, and indigent insane may be cared for in almshouses by the county commissioners, who are the overseers of the poor. The law provides that all indigent insane persons not requiring mechanical restraint shall be cared for as paupers by the counties, or the judge may commit them to any responsible person who offers to give them care and custody, without expense to the state or county; nevertheless, practically all classes are sent to the state hospital.

3. **Commitment.**—(a) *Persons Committed.*—The destitute insane other than the incurable and harmless are cared for and treated at the state hospital for the insane. But the judge may in his discretion direct the insane person to be delivered to any other person for his care, custody, and maintenance.

The superintendent of the state hospital, when directed by the board of commissioners of state institutions, may receive any lunatic, idiot, or insane person whose friends, parents, or guardians are able and willing to pay for his care, custody and maintenance. In all such cases the board of commissioners of state institutions prescribes the amount to be paid.

(b) *Legal Procedure in Commitment.*—When a resident of the state



is supposed to be insane, either non compos mentis or sufficiently devoid of reason to be incapable of self-control, a petition signed by five reputable citizens, not more than one of whom may be a relative of the person, stating their belief that he is insane, and asking that a legal examination be made, may be presented to the county judge or judge of the circuit court having jurisdiction. The county judge or judge of the circuit court to whom the petition is submitted must without unnecessary delay appoint as an examining committee one intelligent citizen, who is not a petitioner in the case, and two practicing physicians of good professional standing who are graduates of a school of medicine recognized by the American Medical Association, when such physicians reside in the county. This committee must secure the presence of the supposed insane person, and make a thorough examination to ascertain his mental and physical condition, and if considered insane, whether the insanity is acute or chronic, its apparent cause, the hallucination, if any, and the age and propensities of the subject, also whether he is indigent or possessing available means for his support. If the person alleged to be insane any time prior to the rendering of the decree in the case, applies to the court for permission to contest the charge of insanity, the court must appoint a hearing. If the accused is indigent and unable to procure the attendance of witnesses in his behalf, the court must summon a reasonable number of witnesses for him at the expense of the county.

The examining committee must report its findings to the county judge or judge of the circuit court, and furnish the information called for in the preceding section, each of the three committeemen signing the report.

On receiving the report of the examining committee, the county judge or judge of the circuit court, if satisfied that the person is insane, must order the sheriff of the county from which the report is submitted to deliver at once the person adjudged insane to the superintendent of the hospital for indigent insane. The order of commitment must include a copy of the information and report by the committee and be transmitted by the sheriff to the superintendent of the hospital.

When the report of the examining committee shows that the alleged insanity is chronic, or produced by epilepsy or senility, and that the person does not require confinement or mechanical restraint to prevent self-injury or violence to others, but that he is indigent, the judge must find him incurably insane, harmless and indigent, and order the sheriff to deliver him to the county commissioners of the county where he resides for care and maintenance as by law provided for paupers. But if any responsible person will offer to assume the care and custody of any such harmless person without cost to the state or county, the judge or court may in his discretion so order.

(c) *Voluntary Admission.*

(d) *Appeal from Commitment.*—Any person detained in custody may, by himself or by some other person, prosecute a writ of habeas corpus.

(e) *Cost of Commitment.*—All costs of commitment are paid by the county unless the patient has sufficient estate, in which case he is liable.

4. *Conveying Patients to the Hospital.*—The superintendent of the hospital must send a nurse or some suitable person to transport a committed patient to the hospital.

5. *Transfer of Patients.* 6. *Parole and Discharge of Patients.*—Patients regarded as sufficiently harmless may be sent home on furlough by the superintendent of the state hospital, provided that relatives or other persons are willing to sign an agreement guaranteeing transportation, maintenance, and medical care at home, and, if further hospital treatment should be necessary, the return of the patient to the hospital without expense to the state or county.

Non-resident patients are formally discharged by the superintendent and returned to their state of residence, accompanied by an attendant, the board of commissioners authorizing the return at the expense of the state.

Patients deemed ready for discharge are examined by the superintendent and staff of the hospital. When discharged, an indigent patient is given transportation to the place from which he was committed, or to an equivalent distance elsewhere; pay patients are not given return transportation.

7. *Cost of Maintenance.*—The destitute insane are maintained at the expense of the state.

8. *Criminal Insane.*—When a person tried for an offense is acquitted by the jury on account of insanity, the jury, in giving their verdict of not guilty, shall state that it was given for such cause, and, if the discharge or going at large of such insane person is considered by the court manifestly dangerous, it must order him to be committed to jail or otherwise to be cared for as an insane person, or may give him into the care of his friends, on their giving satisfactory security for his proper care and protection; otherwise, he shall be discharged.

The prison physician directs the removal of insane convicts to the prison hospital when it can be done without danger or detriment to the other inmates of the prison.

## GEORGIA

### Authority:

Park's Annotated Code of Georgia, 1914

1. *Administration and Supervision.*—(a) *General.*—There is no state board in Georgia having general supervision or control of charitable institutions.

(b) *Institutional.*—The state hospital for the insane (State Sanitarium) is under the management of ten trustees, appointed biennially by the governor. They receive salaries not to exceed \$150 per annum. The trustees have authority to prescribe all rules and regulations for the management of the institution, to appoint a superintendent, who must be a skillful physician, and all the officers, to fix their salaries, and to remove any officer for proper cause.

The trustees prescribe rules and regulations also in regard to the admission and discharge of insane, epileptics, idiots, and demented inebriates.

A department for insane convicts is to be established on the so-called "State Farm" at Milledgeville, under the control and management of the prison commission, but no appropriation has been made.

2. **Care.**—(a) *In State Institutions.*—Georgia State Sanitarium, Milledgeville; established 1842; 3800 beds.

The statutes require white and negro patients to be cared for in separate departments; likewise, residents, non-residents, and convicts.

(b) *In Local Institutions.*—Harmless incurable insane may be cared for in the county poorhouses or otherwise taken care of by the county authorities. The poor farms are under the management of the ordinary of each county, who may appoint a commissioner of the poor.

3. **Commitment.**—(a) *Persons Committed.*—All resident citizens of the state who are insane, idiots, epileptics, or demented inebriates may be admitted, but the superintendent may refuse all harmless idiots and other harmless subjects that do not actually require treatment so long as there are any recent and dangerous cases unprovided for. Non-resident pay patients may be received, but citizens of Georgia have the preference when all cannot be accommodated and are treated free; no non-resident patients have been admitted for nearly fifty years.

(b) *Legal Procedure in Commitment.*—The various laws concerning commitment have been so construed that in practice no patient, white or negro, is admitted to the state hospital without trial by jury.

A pay patient, restrained in the state, may not be admitted unless accompanied by authentic evidence of insanity, or a certificate of three reputable practising physicians, well acquainted with his condition, or from one such physician and two respectable citizens. A pay patient, not a resident of the state, may not be admitted unless producing an authentic record of a conviction by a competent court of a malady which, according to the law of the state, is a ground of admission, or a certificate of physicians endorsed by the judge having jurisdiction. Before or after admission of a pay patient, resident or non-resident, by certificate, the person alleged to be insane, or his friend or relative, may demand a trial of the question of insanity by jury, which must be had in the county of Baldwin. In practice, no patients have been required to pay for their maintenance for nearly fifty years.

The certificate of the ordinary of the county where an insane negro resides, of his condition, mental and pecuniary, is sufficient to grant his admission to the hospital.

On the sworn petition of any person that another is liable to have a guardian appointed (or is subject to be committed to the state sanitarium), the ordinary after notice has been given to the three nearest adult relatives of such person must issue a commission directed to any eighteen discreet and proper persons, one of whom shall be a physician, requiring any twelve of them, including the physician, to examine the



person for whom guardianship (or commitment to the sanitarium) is sought. But in all insanity cases the number of jurors is six, one of whom must be a physician, unless twelve are demanded by the person tried, or by his relatives or friends. The commission must find whether the person is to have a guardian appointed or to be committed to the state sanitarium, and make return to the ordinary, who must act accordingly.

Guardians of insane persons may place them in the Georgia State Sanitarium, if such a course is necessary for their own protection or the safety of others, and a guardian wilfully failing to take this precaution is responsible for injuries inflicted on others by his ward.

When there is no guardian for an insane person, or the guardian refuses or fails to confine his ward, and any person makes oath that the insane person should not longer be left at large, the ordinary or the judge of the superior court must issue a warrant as in criminal cases for the arrest of the insane person and after an investigation of the facts may commit him to the state sanitarium, and may have him committed to jail until he can be removed to the sanitarium.

A patient who is absent for as long as three months, either by discharge, elopement, or removal by friends, cannot be received at the sanitarium without going through the process required by law.

(c) *Voluntary Admission*.—When an application for admission is unattended by the requisite evidences, the superintendent of the sanitarium may receive and provide for the person for a reasonable time, provided a sufficient sum is advanced for his maintenance. The trustees of the hospital require, however, that no patient shall be admitted unless all legal requirements have been complied with.

(d) *Appeal from Commitment*.—A trial by jury may be had by all patients who have been convicted of insanity, if a relative or friend will make an affidavit that he believes the alleged cause of commitment did not and does not exist, and that the conviction was obtained by fraud, collusion, or mistake. The same right exists, when there is an affidavit that the cause of commitment has ceased to exist, and there is a refusal by the superintendent to discharge after demand made.

(e) *Cost of Commitment*.—The expense of a commission in insanity must be paid out of the estate of the insane person; and if he has none, out of the county funds. The cost of conveying a person to the state sanitarium is paid in the same manner.

**4. Conveying Patients to the Hospital. 5. Transfer of Patients. 6. Parole and Discharge of Patients.**—Upon recovery, patients must be discharged by the superintendent under rules prescribed by the trustees.

Upon the certificate of the medical officer of the institution the trustees may discharge or remand to the authorities of the county from which he was sent a patient whose condition is such that no probability exists of his full recovery, and who at the time is regarded as harmless.

**7. Cost of Maintenance.**—The state sanitarium is free to all resident citizens of the state who are insane, idiots, or epileptics. If the family

or friends desire to furnish extra or additional food or other comforts, they may do so under regulations prescribed by the trustees.

**8. Criminal Insane.**—When a person has been guilty of a capital crime and acquitted on the ground of insanity and is committed to the sanitarium, he must not be discharged except by special act of the legislature. If the crime is not capital, he may be discharged by warrant or order from the governor. If sentence is suspended on the ground of insanity, the superintendent upon his restoration to sanity must certify the fact to the presiding judge of the court where he was convicted.

A convict sentenced to the penitentiary who becomes insane must be removed to and kept at the prison farm during the term for which he may have been sentenced, or until he is cured. (This provision is not yet operative.)

## IDAHO

### Authorities:

Revised Codes of Idaho, 1908

Laws of 1915

**1. Administration and Supervision.**—(a) *General.*—There is no state administrative or supervisory board of charitable institutions.

(b) *Institutional.*—The state hospitals are under the management and control of boards of directors, consisting of three persons, appointed by the governor for terms of two years in the case of one institution, and three years in the case of the other. Each board elects a medical superintendent of the hospital, to hold office during its pleasure. It appoints all officers and employees, prescribes their duties, and may remove them when in its judgment the good of the public service so requires; it makes regulations and fixes the terms for the admission of insane persons who are not indigent or who are not residents of the state. The board must visit the hospitals once in three months. The board is required to make an annual report to the governor and a biennial report to the legislature concerning all matters that pertain to the hospital.

The medical superintendent must be a graduate in medicine and must have practiced his profession five years. With the consent of the board of directors, he fixes the number and compensation of and removes the attendants and assistants.

**2. Care.**—(a) *In State Institutions.*—The Idaho Insane Asylum, Blackfoot; established, 1884; 350 beds. Northern Idaho Sanitarium, Orofino; established, 1905; 250 beds.

(b) *In Local Institutions.*—The county poorhouse where such exists may care for insane persons placed therein by the board of county commissioners.

**3. Commitment.**—(a) *Persons Committed.*—All insane persons except idiots, feeble-minded, and those suffering from delirium tremens or a contagious or infectious disease, may be admitted to the hospitals.

No insane non-resident may be received into the hospitals unless he became insane within the state, and the indigent insane of the state must have the preference.

(b) *Legal Procedure in Commitment.*—Whenever it appears by affidavit to the satisfaction of a magistrate of the county that any person within the county is so far disordered in his mind as to endanger health, persons, or property, he must cause such person to be arrested and taken before any judge of a court of record within the county for examination. The two or more witnesses best acquainted with such insane person and at least one graduate of medicine must testify at the examination.

If the physician after hearing the testimony and making the examination believes such person to be dangerously insane, he must make a certificate in the form prescribed by the medical superintendent of the hospital, showing that such person is so far disordered in his mind as to endanger health, person, or property; the premonitory symptoms, apparent cause or class of insanity, the duration and condition of the disease, etc.

The judge, after such examination and certificate, if he believes the person so far disordered in his mind as to endanger health, person, or property, must make an order that he be confined in a state hospital.

(c) *Voluntary Admission.*

(d) *Appeal from Commitment.*—Upon petition on behalf of any person restrained of his liberty, the writ of habeas corpus may be granted by the circuit court or by the district court.

(e) *Cost of Commitment.*—The expenses of the agent, his necessary assistant, and of the insane person when transferred to the hospital, are paid by the hospital.

The physician attending the examination of an insane person is paid by the treasurer of the county where the examination was had.

The judge must inquire into the ability of an insane person committed by him to the hospital to pay for his transportation to the hospital, and the expense of the examination, and bear the actual charges and expenses for the time that such person may remain in the hospital. In case an insane person committed to the hospital is possessed of real or personal property sufficient to pay such charges and expenses, the judge must appoint a guardian for him, who must pay to the board of directors the sum fixed upon by them each month quarterly in advance, for the maintenance and clothing of such ward.

4. *Conveying Patients to the Hospital.*—An insane person, ordered to be committed, must be delivered to the sheriff of the county and by him to the agent appointed by the medical superintendent to convey the insane person to the hospital. Upon receipt of notice from the sheriff, the medical superintendent must at once designate some person among the employees of the hospital as an agent to transport such insane person to the hospital. Such agent (and assistant if any be appointed) must at once convey the insane person to the hospital and surrender him to the medical superintendent; and the latter shall at once notify the governor that the insane person has been received.

5. *Transfer of Patients.* 6. *Parole and Discharge of Patients.*—The board of directors may on the recommendation of the superin-



tendent parole patients who are not dangerously insane. Any person aggrieved by the granting of such parole may appeal to the district court within thirty days and the court may affirm or modify the order.

Insane persons received in the hospital must upon recovery be discharged therefrom.

**7. Cost of Maintenance.**—The expense of maintaining insane patients at the hospital is borne by the state unless the inmate has sufficient estate to pay it.

**8. Criminal Insane.**—Insane convicts must be received into the state hospital and returned to the state prison when cured in case their sentence at the time of recovery has not expired.

## ILLINOIS

### Authorities:

Hurd's Revised Statutes of Illinois, 1915-1916  
Civil Administrative Code of Illinois, 1917

**1. Administration and Supervision.**—(a) *General.*—The executive and administrative supervision of all state institutions for the care of the insane is exercised by the department of public welfare. The department has all the rights, powers, and duties formerly vested in the board of administration, state deportation agent, state agent for visitation of children, commissioners and wardens of the state penitentiaries and reformatories, board of pardons, board of prison industries, and board of classification.

The department is under the control of a director, who is appointed by the governor. He receives a salary of \$7000 per year. In addition to the director, the governor appoints an assistant director, receiving a salary of \$4000, and the following executive officers, all receiving salaries of \$5000: alienist, criminologist, fiscal supervisor, superintendent of charities, superintendent of prisons, and superintendent of pardons and paroles. All officers devote the entire time to their duties during the four-year term, and are bonded in not less than \$10,000. The director reports annually to the governor and biennially to the general assembly.

In addition to succeeding to all rights and duties of the former board of administration so far as property rights are concerned, the department of public welfare regulates the admission of patients to state hospitals; appoints and removes superintendents of these institutions, and, subject to the civil service law, appoints all employees and fixes their salaries; investigates all private institutions for the insane, makes stated visits to the hospitals for the purpose of inspection and oversight; and holds meetings with the superintendents of hospitals and the board of public welfare commissioners to consider in detail all questions relating to the treatment and care of the insane.

Each managing officer of a hospital for the insane must develop occupations that serve the mental, moral, and physical improvement, or the happiness of the inmates; and it is the duty of the department of

public welfare to co-ordinate these activities as will best serve an educational, economical, and efficient administration of all the institutions.

Within the department there is a board of public welfare commissioners, composed of five officers serving without salary. The board is purely advisory and non-executive: its general powers and duties are to consider and study the field, to advise the executive officers of the department upon request, to recommend policies and practices, to give advice and make recommendations to the governor and general assembly, to investigate the conduct of the work of the department, and for this purpose to have access to all books, documents, papers, and records, and to require written or oral information from any officers or employee.

The more specific duties of the board are to investigate the condition and management of the whole system of state charitable, penal, and reformatory institutions, including state hospitals; when directed by the governor, to investigate and report to him concerning the equipment, management, or policy of any state charitable, penal, or reformatory institution; to inquire into the equipment, management, and policies of all institutions and organizations coming under the supervision and inspection of the department of public welfare; to collect and publish annually statistics relating to insanity and crime.

All other than state institutions giving treatment and care to persons suffering from mental and nervous diseases must provide the department of public welfare with detailed information from time to time, regarding their physical equipment and medical and nursing service, and furnish it a certified statement every three months, giving the admissions, deaths, and discharges during the previous three months. The department must license such institutions as it deems suitably equipped and conducted, and no person may be committed to or received in any such institution not having a valid license from the department under a penalty of a fine from \$50 to \$1000, or imprisonment for not more than six months, or both.

(b) *Institutional*.—There are no local boards of trustees.

2. **Care**.—(a) *In State Institutions*.—Jacksonville State Hospital, Jacksonville; established 1847; 2100 beds.

Chicago State Hospital, Dunning; established 1860; 3300 beds.

Elgin State Hospital, Elgin; established 1869; 2056 beds.

Anna State Hospital, Anna; established 1869; 1900 beds.

Kankakee State Hospital, Kankakee; established 1877; 3250 beds.

Chester State Hospital, Menard; established 1889; 220 beds. (For the dangerous insane.)

Watertown State Hospital, Watertown; established 1895; 1660 beds.

Peoria State Hospital, Peoria; established 1895; 2300 beds.

Alton State Hospital, Upper Alton; established 1913; 400 beds.

The state psychopathic institute is located at Kankakee.

(b) *In Local Institutions*.—Cook County maintains a psychopathic hospital (220) beds as a department of the Cook County Hospital.

The department of public welfare is required to remove insane

persons from county almshouses to state hospitals, the state having assumed complete care of its insane and feeble-minded.

(c) *In Families*.—Any insane patient in any state hospital may be placed at board in a suitable family home by the department of public welfare. The cost of boarding out a patient may not exceed the average per capita cost of his maintenance in the hospital. Patients boarded out must be visited at least once in three months. A patient boarded out may be permitted by the department temporarily to leave custody as an insane person in charge of his guardian, relatives, friends or by himself, for a period not exceeding one year, and may be received again when returned by guardian, relations or friends, or upon his own application, without any further order of commitment. During such temporary absence the department may assist in his maintenance to an amount not exceeding the rate paid for his board.

3. **Commitment.**—(a) *Persons Committed*.—All insane persons residents of the state, not idiots and epileptics, are entitled to admission to the hospitals for the insane.

By insane is meant any person who by reason of unsoundness of mind is incapable of managing his own estate, or is dangerous to himself or others, if permitted to go at large, or is in such condition of mind or body as to be a fit subject for care and treatment in a hospital or asylum for the insane. No person, idiot from birth, or whose mental development was arrested by disease or physical injury occurring prior to the age of puberty, and no person who is afflicted with simple epilepsy is regarded as insane, unless the manifestations of abnormal excitability, violence or homicidal or suicidal impulses are such as to render his confinement in a hospital or asylum for the insane a proper precaution.

Insane persons not residents of the state may not be detained in any private institution for the insane unless committed in accordance with the laws of the state in which they are residents, or with the laws of Illinois.

No private patient may be admitted to a state hospital for the insane until a bond with sureties has been filed with the superintendent, and approved by the county judge conditioned to provide suitably for him and to remove him when required.

(b) *Legal Procedure in Commitment*.—No person not legally adjudged to be insane may by reason of his insanity or supposed insanity be restrained of his liberty, except that the temporary detention of an alleged lunatic is permitted for a reasonable time, not exceeding ten days, pending a judicial investigation of his mental condition.

Any reputable citizen of the county in which a person supposed to be insane resides or is found may file with the clerk of the county court a sworn statement that the person named is insane and requires restraint or commitment to some hospital for the insane. The statement must be accompanied by the names of the witnesses (one of whom at least must be a physician having personal knowledge of the case). When the person alleged to be insane has not been examined by a physician, the judge may appoint a qualified physician of the county



to make such examination. The hearing of the case may take place with or without the presence of the person affected as circumstances warrant, but not until he has been notified.

Inquests in lunacy must be by jury or a commission of two licensed physicians. When no jury is demanded, and there appears to the judge to be no occasion for it, he must appoint a commission of two qualified physicians in regular and active practice, who are residents of the county and of known competency and integrity, to make a personal examination of the patient and file with the clerk of the court a sworn report of the result of their inquiries, together with their conclusions and recommendations. The commissioners have power to administer oaths and take sworn testimony. In all cases of inquest by jury, the jury must consist of six persons, and one of the jurors at least must be a qualified physician. Inquests in lunacy may be in open court or in chambers, or at the home of the person alleged to be insane, at the discretion of the court. The judge may require all persons other than the patient, his friends, witnesses, licensed attorneys and officers of the court to withdraw from the room during the inquest.

The jury or commission must furnish the court in writing answers to the interrogatories that may be prescribed by the department of public welfare, and certify to their correctness. The interrogatories must be submitted to the medical member or members of the jury or commission by the court.

The court may, if not satisfied with the finding of the jury or commission, set the same aside and order another inquest.

Upon the return of the finding of the jury or commission, the court must enter the proper order for the disposition of the person alleged to be insane, and order his discharge with or without conditions, or remand him to the custody of his friends, or commit him to some hospital or asylum.

At the time of each inquest in lunacy, the county judge must inquire into the pecuniary condition of the person alleged to be insane, and that of the relatives who are bound by law to maintain him.

When the order of commitment has been entered, the clerk of the county court must send copies of the papers in the case to the superintendent of the hospital who must admit the patient without delay. If there is no room or the hospital or the county has its full quota of patients, the superintendent must make room for a patient recently adjudged insane by returning a quiet, harmless chronic insane to the county from which he was admitted or to a hospital for chronic insane.

If a person alleged to be insane is possessed of any estate, the person filing the application for an inquest in lunacy may make at the same time application for the appointment of a conservator of the alleged lunatic. If he is adjudged insane without application for a conservator having been made, and if he has any estate, the court may, upon petition, make an appointment of a conservator. In a county with a probate court, upon filing of the proper petition, together with the duly certified copy of the record and the verdict of the jury, or the report

of the commission of physicians, and the judgment of the county court finding a person insane, the probate court may without further inquest appoint a conservator.

(c) *Voluntary Admission*.—Any person in the early stages of insanity who may desire the benefit of treatment in a state or licensed private hospital for the insane as a voluntary patient, may be admitted to it on his written application, accompanied by a certificate from the county court of the county in which he resides. All voluntary patients have the right to leave the hospital at any time on giving three days' notice to the superintendent.

(d) *Appeal from Commitment*.—Appeals are allowed to the circuit court from any order or judgment made and are rendered under the act governing commitments upon the appellant giving such bond and security as the court may direct.

Every person confined as insane is entitled to the benefit of the writ of habeas corpus, and the question of insanity must be decided at a hearing. If the judge decides that the person is insane, this does not bar the issuance of the writ a second time or whenever it is alleged that he has been restored to reason. If the person is adjudged sane, the court where the inquest was had must, on the presentation of a certified copy of the judgment, rescind the judgment of insanity.

(e) *Cost of Commitment*.—The costs of proceedings in inquests of lunacy in case of county patients are paid from the county treasury of the county of which they are residents; but in case of private patients, if the person is found to be insane, they must be paid by his guardian or conservator out of his estate. When the person is found not to be insane, the court may require the costs to be paid by the person who filed the application for commitment.

4. **Conveying Patients to the Hospital**.—The clerk must issue a warrant, in duplicate, directed to the sheriff or any suitable person, giving preference to some relative of the insane person, when desired, to deliver the insane person to the superintendent. No female patient may be taken to the hospital by any person not her husband, father, brother, or son, without the attendance of some other female of reputable character and mature age.

5. **Transfer of Patients**.—The department of public welfare has power to transfer patients from one state hospital for the insane to another, when in its judgment transfers are advisable.

6. **Parole and Discharge of Patients**.—Under regulations of the department of public welfare, patients may be released on parole for any term not exceeding three months, and, if not returned to the institution within that period, a new order of commitment from the county judge is necessary for readmission to the institution; but the court may make such order upon the old verdict, if satisfied that the patient in question is still insane.

Subject to the rules of the department of public welfare, the superintendent of a hospital may discharge a patient because he is not insane, or because he has recovered, or because he is so far improved

as to be capable of caring for himself, or because the friends of the patient request his discharge, and in the judgment of the superintendent no evil consequence is likely to follow such discharge, or because there is no prospect of further improvement under treatment. No patient who has not recovered his reason or who is charged with crime may be declared discharged until at least ten days after notice to the judge of the county court having jurisdiction in the case, in order to enable the judge to make proper order as to the disposition of the patient upon discharge.

A person discharged from a state hospital or asylum for the insane must be provided with suitable clothing and a sum of money, not exceeding \$20, sufficient to defray his expenses home, which are charged to the patient, if a private patient, and if a county patient, to the county.

When notified that a patient has been discharged as cured, the judge of any county court must enter an order restoring the patient to all his rights as a citizen, and if a conservator of his estate has been appointed, the conservator must be removed. At any time subsequent to the discharge of any patient, the judge of the county court may hear evidence tending to show that the patient has been restored to reason, and if satisfied of his recovery may enter a similar order, whereupon the patient is not liable to commitment to a hospital without a new inquest in his case.

A staff physician, or some other suitable person must, when the superintendent deems it necessary, visit the home of any paroled patient or any convalescent patient before discharge and advise with the family as to the care and occupation most favorable for the patient's continued improvement. Visits must be made from time to time to the patient after parole or discharge as are considered necessary by the superintendent.

**7. Cost of Maintenance.**—All insane persons in the state hospitals are maintained at the expense of the state. When they are able to do so, relatives or estates of patients must furnish their clothing.

**8. Criminal Insane.**—Insane convicts in the state penitentiaries may be committed to the asylum for insane criminals without formal inquest on the certificate of the penitentiary physician, and held until adjudged by the superintendent and the department of public welfare fit to be discharged.

Where any person is sent to a state hospital for the insane, being acquitted of crime on the plea of insanity, or being under indictment for crime, the state's attorney in charge of the case must officially notify the superintendent of the hospital to which the accused is sent, of any indictment pending against such person, or of the fact that the accused has been acquitted of his crime on the plea of insanity, and the superintendent, in case he at any time discharges the accused, must officially notify the state's attorney of the fact of the discharge and the reasons therefor.



## INDIANA

## Authorities:

Burns' Annotated Indiana Statutes, 1914  
Laws of Indiana, 1917

1. **Administration and Supervision.**—(a) *General.*—The board of state charities is composed of the governor of the state as ex-officio member and chairman and six uncompensated members—three from each leading political party—appointed by him for terms of three years. This board must investigate and examine into the condition and management of hospitals, and the officers in charge of the hospitals must furnish to it all the information and statistics which it may require. At any time it may investigate the management of any correctional or charitable institution of the state, and must report the result of its investigation to the governor, who must submit it to the general assembly.

The judge of the circuit court of any county may and upon the petition of fifteen citizens must appoint a board of county charities. These boards are composed of six unsalaried members not more than four of whom shall be men and shall be appointed for terms of three years. At least once each quarter and as much oftener as they think necessary, the board in each county must inspect the county poor asylums and any other charitable and correctional institutions in the county which receive public aid. It must make a quarterly report to the board of commissioners of the county of the condition of each institution, and must present annually a report of its work to the judge of the circuit court and to the board of state charities. It must report to the board of county commissioners and the board of state charities any facts in connection with an institution which ought to be known to the commissioners, especially anything injurious to the county or to the inmates of the institution, and must suggest remedies for the evils reported. At any time the county board of charities may call upon the board of state charities for advice and assistance.

The board of county commissioners has supervision of the county asylum for the poor and of the county asylum for the incurably insane in any county in which one has been established. These commissioners appoint the superintendent of the county asylum for a term of four years.

Township trustees are ex-officio overseers of the poor and have charge of indigent persons who are not provided for in public institutions.

(b) *Institutional.*—Each of the general state hospitals for the insane is under the legal custody and supervision of a board of trustees composed of four compensated members not more than two of whom can be from one political party. These trustees are appointed by the governor for four-year terms and are removable by him for cause after an opportunity to be heard upon written charges. Each board appoints as superintendent for the hospital under its charge a reputable physician who has had experience in an institution for the insane, and fixes the number of subordinate officers and employees and their com-

pensation. The superintendent has personal charge and supervision of the institution and its inmates and appoints all other officers and employees subject to the rules, regulations, orders, and general control of the board of trustees, to whom he must make his reports. The board meets at the hospital every month and must make an annual report to the governor. This report must be printed and transmitted by the governor to the general assembly with his annual message.

The hospital for insane criminals at Michigan City is under the management of the board of trustees and warden of the state prison. The physician in charge must have had at least three years' practical experience as a physician.

2. **Care.**—(a) *In State Institutions.*—Central Indiana Hospital for the Insane, Indianapolis; established 1844; 1434 beds.

Northern Indiana Hospital for the Insane, Logansport; established 1883; 1000 beds.

Eastern Indiana Hospital for the Insane, Richmond; established 1883; 867 beds.

Southern Indiana Hospital for the Insane, Evansville; established 1883; 870 beds.

Southeastern Hospital for the Insane, North Madison; established 1905; 1150 beds.

Indiana Hospital for Insane Criminals, Michigan City; established 1909; 175 beds (for males only).

The statutes require that male and female insane shall be treated in separate wards or departments.

(b) *In Local Institutions.*—Each county provides in the county poor asylum for such of its indigent insane, especially incurably insane, as cannot be received into the state hospitals. Counties of 150,000<sup>1</sup> or more population may provide a separate asylum for the care and treatment of incurably insane paupers. The board of county commissioners may contract with guardians for the treatment of the incurably insane of the county not paupers in these asylums at reasonable compensation.

3. **Commitment.**—(a) *Persons Committed.*—All insane persons, not idiots, residing in the state who have legal settlement in any county therein are entitled to be maintained and to receive medical treatment in the state hospitals for the insane at the expense of the state.

(b) *Legal Procedure in Commitment.*—Upon a statement in writing to the probate court of any county, that an inhabitant of the county is of unsound mind and incapable of managing his own estate, the court shall cause an issue to be made out and hold a hearing to determine the sanity of the person. The hearing may be by the court with or without a jury, and it is the duty of the prosecuting attorney to appear and protect the interests of the person alleged to be of unsound mind. If the person is found to be of unsound mind, the court must appoint a guardian to have the custody of his person and the management of his estate. If the court finds that the person is dangerously insane it must make such order for his safe-keeping as is necessary. An allegation that

<sup>1</sup> Marion County—City of Indianapolis.

a person of unsound mind has become of sound mind may be tried and determined in the same manner as an allegation of unsoundness of mind.

Proceedings for committing an alleged insane person to a general state hospital for the insane are by a sworn statement regarding his insanity by a citizen of the county filed with a justice of the peace and upon an examination and a hearing held by this justice and two reputable practising physicians of the county selected by him, or by the circuit or superior court. At this hearing the justice may examine witnesses against and in behalf of the person alleged to be insane, may summon medical examiners, and must obtain a certificate of the medical attendant of the alleged insane person giving the medical history of the case. The medical examiners must make a sworn statement of the results of their examination, declaring whether in their opinion the person under examination is insane or not, and the justice must deposit a sworn statement of his findings, and all the documents in the case, with the clerk of the county circuit court. If the person has been found insane the clerk of the court must apply to the superintendent of the proper hospital for the admission of the insane person, accompanied by a certificate of a justice of the peace that such person has a legal settlement in the county in which settlement for him is claimed. Until he can be received into the hospital, the clerk must direct how he shall be taken care of, and, if necessary, may order his confinement in the county jail. The superintendent immediately must determine the nature of the case and whether the person can be received into the hospital.

If the applicant does not have a legal settlement in the state, or if the place of settlement is in doubt, the superintendent must notify the board of state charities. The board must make an investigation and may order the applicant committed or deported. The expense of deportation is paid by the state.

Applicants for admission into the hospitals when they are crowded must be received in the following order: (1) recent cases, when the disease is of less than one year's duration, (2) chronic cases, more than one year's duration, presenting the most favorable prospects of recovery, (3) those for whom application has been longest on file. Superintendents are required to see that each county has a just proportion of its applicants accepted according to its population, but the trustees may give preference to recent cases from one county over chronic cases from another.

Rejected applications may be renewed by the proper county clerk by reference to the original application, and may be accepted by the superintendent, provided the renewal is made within six months of the inquest.

A justice of the peace must issue a warrant to a constable or sheriff for the arrest of any person of whom complaint under oath has been made that he is dangerously insane. The justice must summon witnesses and a jury of disinterested householders, and determine the



sanity of the person complained of as dangerously insane. If the jury finds that the person is dangerously insane the justice appoints some one to take charge of and confine the insane person at the expense of the county. The justice must certify his findings in the case to the circuit court of the county wherein a new hearing of the case must be had if the finding was against the insane person, or an appeal may be had by the complainant if the finding was in favor of the person charged with being dangerously insane. Upon verdict in the circuit court that the person is dangerously insane the court must appoint a guardian for him and approve the appointment of the custodian of his person made by the justice of the peace or appoint some other custodian. A person thus declared to be dangerously insane may at any time be committed to a hospital for the insane according to the usual procedure.

Proceedings for the recommitment of a person once declared insane and committed to a hospital but afterward discharged may be instituted upon the affidavit of a physician that the person was adjudged insane, was an inmate of a hospital, was discharged, but is again insane, and a proper subject for treatment in a hospital. A copy of this affidavit certified to by the county clerk and a certificate from the clerk of the county circuit court of the record of the former adjudgment of insanity are transmitted to the superintendent of the proper hospital for the insane or to the friends of the patient, and upon them as a basis an inquest into the mental state of the alleged insane person is made according to the procedure of an original inquest.

(c) *Voluntary Admission.*

(d) *Appeal from Commitment.*—Appeal from commitment may be made on a writ of habeas corpus in behalf of any person committed as insane, and the question of insanity must be decided at the hearing. An adverse decision does not bar the issuance of another writ after three months have elapsed.

(e) *Cost of Commitment.*—A guardian appointed for a person of unsound mind must pay the expenses of the legal procedure out of the estate of his ward. If the person alleged to be of unsound mind is found to be of sound mind, the person who made the charge of insanity against him must pay the costs. The estate of a person of unsound mind must pay the costs of a proceeding brought for his release on the ground of recovery, if the proceedings are successful; if he is held still to be of unsound mind costs are taxed to the person filing the application for him. All expenses incident to commitments into a hospital for the insane are paid by the counties.

If a person declared dangerously insane by a circuit court has no family, the costs of proceedings, commitment, and maintenance are paid out of his estate if he has any, and the costs of the proceedings in the court of the justice of the peace are refunded to the county out of it; but if he has a family these expenses are borne by the county of which he is a legal resident unless his estate exceeds in value \$500. If on the trial in the circuit court he is released, all these expenses are borne by the persons bringing the complaint of insanity against him.

Fees and expenses of lunacy commissions are paid out of the state treasury.

4. **Conveying Patients to the Hospital.**—The county clerk upon receipt from the superintendent of the acceptance of an application must issue a warrant to the sheriff or other suitable person to arrest and convey the person to the hospital. A female patient must be accompanied by a female attendant, unless accompanied by husband, father, or son.

5. **Transfer of Patients.**—An inmate of any state hospital who has not a legal settlement in a county of the district in which the hospital is situated may be transferred to the hospital of his proper district by mutual agreement of the respective boards of trustees. By mutual agreement of the boards of trustees of any two hospitals for the insane, a patient may be transferred for any sufficient reason, not oftener, however, than once in five years.

The governor may cause the transfer of any ward or inmate upon a petition being filed with him by the superintendent.

6. **Parole and Discharge of Patients.**—A patient who has been restored to health must be discharged by the superintendent of the hospital for the insane to the sheriff of the county from which the patient was committed, to friends willing and able to care for him, or to himself if he is able to provide for himself. Discharge to a sheriff is to remove the patient to his home and is made upon order from the clerk of the county circuit court on notice to the clerk from the superintendent of the hospital.

An inmate of a county asylum for the incurably insane may be discharged by the board of county commissioners to friends willing and able to provide for him.

7. **Cost of Maintenance.**—Insane paupers for whom a guardian has been appointed are provided for under the laws regulating the relief of the poor.

The expenses for maintenance of a person dangerously insane must be paid out of his estate on direction of the court which has declared him insane, or if the estate is insufficient, or necessary for the support of his family, out of the county treasury.

When a person is supported at public expense in a hospital for the insane and is found to have an estate which is not needed for the support of other dependents, the amount of expenses incurred by the state is a charge against the estate.

If insane persons committed to a hospital for the insane are not supplied with an ample supply of suitable clothing, the clerk of the county must furnish the necessary supply at a cost not to exceed \$30, to be paid out of the county treasury. Inmates of a hospital not otherwise supplied must be furnished by the superintendent with the necessary clothing at an expense of not more than \$20 per annum for each patient; to be charged to the county from which he was committed.

8. **Criminal Insane.**—When the defendant in a criminal cause desires to plead insanity, his defense must be set up in writing.

The jury or court trying the case is required to determine whether the defendant was insane at the time of commission of the act and whether not guilty because of insanity at that time.

If the defendant is found not guilty on account of insanity the court must find as to the defendant's sanity at the time of the trial. A male defendant found insane is committed to the hospital for insane criminals, a female to any state hospital where there are females. If the defendant is sane at the time of the trial, but a recurrent attack of insanity highly probable, he is committed as above.

Any time after six months the insane convict may file in the court in which he was committed an application to be discharged, and if the judge is satisfied that sanity is restored and recurrence of insanity improbable he must order him discharged. A subsequent application for discharge may not be made within two years of a previous one.

If a court before the trial, or during its progress but before the final submission of the cause to the court or jury, believes the defendant insane, two physicians must be appointed to examine him and testify at a hearing; other evidence may be introduced to prove the defendant's sanity or insanity. If the court finds that the defendant has comprehension sufficient to understand the nature of the criminal action against him and the proceedings thereon and to make his defense, the trial may not be delayed. In event of the opposite finding, the defendant must be committed to the hospital for insane criminals if a male, or to a state hospital if a female.

When the superintendent of a hospital certifies that the defendant has become sane or the court is sufficiently advised of restoration, the defendant is placed on trial.

The sheriff is allowed fees, as for taking insane persons to a hospital.

Upon certification by the physician of a state prison or reformatory to the superintendent or warden that a convict is insane, the superintendent, or warden, if satisfied of his insanity, must report the case to the governor. Upon the order of the governor, to whom he reports their findings, the superintendent or warden convenes a lunacy commission, made up of a resident justice of the peace and two physicians, to examine the alleged insane convict and report on his condition. Five days before the holding of the examination the superintendent or warden must notify the next friend or relative of the convict, and the board of state charities. The governor, if convinced that the convict is insane, orders him committed to the state hospital for insane criminals and orders the general superintendent or warden to transfer him. An insane convict receives credit on his sentence for the time he is under treatment in the state hospital for insane criminals.

The governor, upon notice from the warden or physician of the hospital for the criminal insane that a convict confined as insane has recovered his sanity, orders him transferred to the penal institution from which he was removed if the recovery occurred before the expiration of the sentence for crime. If the insanity of a convict continues beyond the expiration of his sentence for crime, he is kept in the



hospital for criminal insane until he regains his sanity, but upon certification of his recovery by the physician and warden of the hospital, the governor orders the warden to discharge him and to report his discharge to the institution from which he was transferred, and to the board of state charities.

## IOWA

### Authorities:

Code of Iowa, 1897

Supplement to Code of Iowa, 1913

Laws of Iowa, 1911

**1. Administration and Supervision.**—(a) *General.*—The board of control of state institutions is composed of three electors, not more than two of whom may belong to the same political party or reside in the same congressional district, appointed by the governor for terms of six years and subject to removal by him. Each member receives a salary of \$3000 per annum and necessary traveling expenses within the state. The board is vested with the management of all state charitable and correctional institutions, replacing the former boards of trustees, and exercises supervisory powers over all county and private institutions in which insane persons are cared for. The board is required to gather and present information in regard to the best and most successful methods of caring for the insane, to encourage scientific investigations by the medical staffs of the hospitals for the insane and to publish the results of the scientific and clinical work done in these institutions. The board must make a biennial report to the governor and legislature.

The board of control has the direction and management of the state hospitals for the insane. It appoints for each one a qualified medical superintendent for a term of four years and may remove him for cause. It fixes the number and salaries of employees, but the discharge of employees is a function of the superintendents. It is obligatory upon the board to make monthly visits to the state hospitals.

The county homes (poor asylums) are under the control of the board of county supervisors, who appoint the stewards and prescribe the regulations for their management. The county poorhouses with departments for the insane are subject to monthly visits by the board of control of state institutions.

(b) *Institutional.*—There are no local boards of trustees.

**2. Care.**—(a) *In State Institutions.*—Mount Pleasant State Hospital, Mt. Pleasant; established, 1850; 1000 beds.

Independence State Hospital, Independence; established, 1869; 1224 beds.

Clarinda State Hospital, Clarinda; established, 1885; 1160 beds.

Cherokee State Hospital, Cherokee; established, 1902; 1000 beds.

(b) *In Local Institutions.*—Most of the counties (sixty-four in all) maintain county homes having special accommodations for the cure of chronic and incurable harmless insane who are residents of the county.

3. **Commitment.**—(a) *Persons Committed.*—All insane persons, not idiots, with a legal residence in the state are entitled to admission to the state hospitals if found fit subjects for treatment in these institutions. Persons found to be without a legal settlement in the state who become insane must be cared for in a state hospital, until their legal residence can be ascertained, or they can be transported to it.

(b) *Legal Procedure in Commitment.*—Each county has a board of three commissioners of insanity, and in counties where district court is held in two places there is one such board of commissioners at each place, consisting of the clerk of the district court, or his deputy, one physician in actual practice and of good professional standing, and one lawyer in actual practice and of good standing, appointed by the judge of the district court. The appointments may be made by the court for terms of two years. The clerk of the board must sign and issue all notices, appointments, warrants, etc., and file and preserve in his office all papers connected with any inquest by the commissioners. The commissioners have cognizance of all applications for admission to the hospital, or for the safe-keeping otherwise of persons within their respective counties, except in cases otherwise specially provided for.

Applications, directed to the commissioners of insanity, for admission to the hospital must be made in the form of an information, verified by affidavit, alleging that the person in whose behalf the application is made is believed by the informant to be insane, a fit subject for custody and treatment in the hospital, and that he is in the county. The commissioners may examine the informant and other witnesses under oath, and may require that the person for whom admission is sought be brought before them, providing for his custody meanwhile. Any citizen of the county or relative of the person alleged to be insane may appear and resist the application, and employ counsel. The commissioners must appoint some regular practising physician of the county to make a personal examination of the person alleged to be insane. The examining physician must endeavor to obtain from the relatives of the person, or from others who know the facts, answers to prescribed interrogatories, the answers to be attached to his certificate. If the commissioners find the person is not insane, they must order his immediate discharge, if in custody; but if insane and a fit subject for custody and treatment in the hospital, they must order his commitment to the hospital in the district in which the county is situated.

If at any time it is necessary to discriminate in the general reception of patients in a hospital, a selection must be made in the following order: (1) cases of less duration than one year; (2) chronic cases, where the disease is of more than one year's duration, presenting the most favorable prospects for recovery; (3) those for whom application has been longest on file; (4) where cases are equally meritorious in all other respects, the indigent have the preference.

The commissioners of insanity, with the consent of the board of supervisors of any county having insane persons and no proper facilities for their care and treatment, may, with the consent of the board of

control, provide for their care at the expense of the county at any convenient private or county institution.

No person may be confined in any private institution for the care or treatment of the insane, except upon the certificate of a board of commissioners of insanity of some county in the state, or of two reputable physicians, at least one of whom must be a bona fide resident of the state.

The superintendents of the hospitals for the insane are required immediately to notify the board if there is any question of the propriety of the commitment or detention of any patient received.

An insane person who cannot at once be admitted to a hospital or whose case is appealed must be suitably provided for by the commissioners if he cannot safely be allowed to go at liberty. He may be cared for as a private patient by relations or friends who will provide for him without public charge. In such case, the commissioners must appoint some suitable person special custodian. In the case of public patients the commissioners must require that they be cared for by the board of supervisors at the expense of the county. On application in behalf of persons alleged to be insane, whose admission to the hospital is not sought, asking for their care as insane within the county, the commissioners, on proof of their insanity and need of care, may provide for them, as in case of other applications.

No person who is found to be insane may, pending admission to the hospital, be confined in any jail or place of solitary confinement, except in cases of extreme violence; and in such a case there must at all times be a suitable person in charge of him. At no time may any female be placed in such confinement without at least one female attendant remaining in charge of her.

(c) *Voluntary Admission.*

(d) *Appeal from Commitment.*—On a statement in writing, verified by affidavit, addressed to a judge of the district court of the county in which the hospital is situated, or of the county in which any person confined in a hospital has his legal settlement, alleging that he is not insane, the judge must appoint a commission of not more than three persons to inquire into the merits of the case one of whom must be a physician, and if two or more are appointed, another must be a lawyer. They must forthwith report to the judge the result of their examination and accompany it by a statement of the case, made and signed by the superintendent. If the judge finds the person not insane, he must order his discharge; if the contrary, he must authorize his continued detention. The applicant must pay the costs of the inquiry if the judge finds that the application was made without probable ground. A commission of inquiry may not be repeated oftener than once in six months in regard to the same person, nor may a commission be appointed in the case of any patient within six months of the time of his admission.

(e) *Cost of Commitment.*—The expenses of the arrest, care, investigation, and commitment of an insane person without a legal settlement



including the costs of appeal, if one is taken and the person is found to be insane on appeal, are paid in the first instance by the county in which the person is found to be insane. If he has a legal settlement in another county of the state, the expenses are to be paid by that county. If the person has no legal settlement within the state, the expenses are paid by the state.

**4. Conveying Patients to the Hospital.**—Unless the patient or some one in his behalf appeals the case to the district court, the commissioners of insanity must direct the sheriff to deliver him to the hospital together with all the documents in the case, or may appoint some other suitable person. No female may be taken to the hospital without the attendance of some other female or some relative. The superintendent, in his acknowledgment of delivery, must state whether there was any such person in attendance. Any relative or immediate friend of the patient, who is a suitable person, has the privilege of executing the warrant in preference to the sheriff or any other person.

**5. Transfer of Patients.**—Insane persons who have been under care outside of the hospital by authority of the commissioners of any county may, on application, be transferred to the hospital on their warrant. The admission may be had without another inquest at any time within six months after the inquest already had.

When the board of control finds that any patient cared for at public expense in any private hospital or county institution is violent and his case acute, it may remove him to a state hospital at the expense of the proper county. In like manner, when the board finds a chronic patient in a state hospital, it may order the county to which he is chargeable to remove him to a county or private institution for the insane, but not without the written consent of his immediate relatives or of the commissioners of insanity of the county to which he is chargeable.

**6. Parole and Discharge of Patients.**—Any patient who is cured must immediately be discharged by the superintendent and furnished with a certificate to that effect, a copy of which is to be forwarded to the clerk of the district court of the county from which the patient was committed. The record is *prima facie* evidence of his recovery and restores him to all his civil rights. The relatives of any patient not susceptible of cure by remedial treatment in the hospital, and not dangerous to be at large, have the right to take charge of and remove him. No patient under criminal charge or conviction may be discharged without the order of the district court and notice to the county attorney.

**7. Cost of Maintenance.**—Indigent patients are maintained at the expense of the county in which they have a legal residence. If they have no such residence they are charges upon the state.

When the superintendent of the hospital has been notified that a patient sent to the hospital from one county has a legal settlement in another county, he must thereafter hold and treat such patient as from the latter county; and such holding applies to expenses already incurred in behalf of such patient and remaining unadjusted. Patients

in a hospital having no legal settlement in the state, or whose legal settlement cannot be ascertained, are supported at the expense of the state.

The estates of insane persons and of their relatives are liable for their support; and the auditors of the several counties are authorized and empowered to collect from the property of such patients, or from any person legally bound for their support, any sums paid by the county in their behalf.

The estates of all patients in state hospitals for the insane who are non-residents of this state, and all persons legally bound for their support are liable for the reasonable value of the care and treatment of such patients while in the hospitals.

The relatives or friends of any patient in a hospital have the privilege of paying any portion or all of the expenses.

**8. Criminal Insane.**—In the case of a defendant whose sanity is doubted at any stage of the trial of a criminal prosecution, the proceedings must be suspended and a trial had upon the question of insanity. If the accused is found insane and his discharge is dangerous to public peace, the court must order him committed to the department for criminal insane at the state penitentiary.

If the defendant is acquitted on the ground of insanity and his discharge is dangerous, the court must order him confined in a hospital for the insane or retained in custody until he becomes sane.

On a sworn application made by any citizen stating that a person confined in any prison within the county charged with a crime, but not convicted thereof nor on trial therefor, is insane, the commissioners of insanity must have the prisoner brought before them, and if they find that he is insane, they must direct his removal to one of the hospitals for the insane, and the superintendent of the hospital designated must receive and keep him as a patient. After an investigation such as contemplated in this section, the commissioners may not entertain a like application within six months on behalf of the same person. When any insane person is thus confined, the superintendent, as soon as such person is restored to reason, must return him to the jail of the county from which he was received.

A convict confined in either of the state penitentiaries who becomes insane must be confined in the department for the insane at the state penitentiary until he has served out his sentence or is pronounced cured, in which latter event he must be held in the penitentiary to serve out his unexpired sentence.

## KANSAS

### Authorities:

General Statutes, 1915  
Laws of Kansas, 1917

**1. Administration and Supervision.**—(a) *General.*—The board of administration of state charitable institutions is composed of three members appointed by the governor for terms of four years, at a salary of \$3500 per annum. The board administers and enforces the laws

relating to the insane and their treatment in or out of hospitals, and has power to make rules and regulations in regard to the licensing, visitation, and inspection of all private institutions for the insane; the forms to be observed in regard to the commitment, transfer, custody and discharge of insane persons; the reports and information to be furnished by superintendents and other executives of all institutions for the insane. The board must visit the state hospitals at least once a month and make an annual report to the governor and biennial report to the legislature.

The state hospital for the dangerous insane is under the board of administration, and the physician of the state penitentiary is its medical superintendent.

No person or physician may establish a private hospital for the care or treatment of the insane for compensation without first obtaining a license from the state board of administration. The application for it must be accompanied by a plan of the premises to be occupied. Before granting any such license, the board must have visited the premises to be licensed. The board may make such terms and regulations in regard to a license as it deems necessary, and may revoke the license of any private hospital or institution for due reasons. Conducting a private hospital or institution without a license is a misdemeanor punishable by a fine of \$10 for each day the institution is carried on in violation of law. The county attorney of the proper county must proceed against the offender.

(b) *Institutional*.—There are no local boards of trustees. The board of administration, with the consent of the governor, must appoint a superintendent or executive officer of each hospital for the insane. Such superintendent must have at least two years' experience as superintendent in a similar institution or be a specialist in nervous diseases. The board fixes the number of subordinate employees and their compensation. The superintendent, subject to the rules and regulations of the board of administration, has personal charge and supervision over his institution and must make his reports to the state board of control.

2. **Care**.—(a) *In State Institutions*.—Osawatomie State Hospital, Osawatomie; established 1866; 1365 beds.

Topeka State Hospital, Topeka; established 1875; 1606 beds.

Hospital for the Dangerous Insane (in connection with state penitentiary), Lansing; established 1911; 60 beds.

Larned State Hospital, Larned; established 1913; 120 beds.

(b) *In Local Institutions*.—Incurable or harmless indigent insane and those who cannot be received by the state hospitals are cared for in the county asylums or by the county commissioners, who have control of these institutions, appoint the superintendents and physicians, and may annually select a board of visitors.

3. **Commitment**.—(a) *Persons Committed*.—All insane persons, except idiots and epileptics, who are residents of the state are entitled to treatment in the hospitals for the insane.



Any person whose mind, by reason of brain sickness, has become unsound, rendering him incapable of managing his own estate or dangerous to himself or others is defined as insane. No person idiotic from birth, or whose mental development was arrested by disease or physical injury prior to the age of puberty, and no person who is afflicted with simple epilepsy, is regarded as insane, unless the manifestations of abnormal excitability, violence or homicidal or suicidal impulses render his confinement in a hospital a proper precaution to prevent him from injuring others or himself.

Insane persons, idiots, imbeciles, and epileptics who are committed by the courts or transferred from the penal institutions are cared for in the state hospital for dangerous insane.

(b) *Legal Procedure in Commitment.*—When a person is supposed to be insane, any reputable citizen of the town or township in which he resides or is found may file a sworn statement with the probate judge of the county that the person named is insane and unsafe to be at large, and that the welfare of himself and others requires his restraint or commitment to some hospital for the insane. The statement must be accompanied by the names of two witnesses. If the person alleged to be insane has not been examined by a physician, the judge may appoint a qualified physician of the county to make an examination.

Upon the filing of the statement, unless the person alleged to be insane is brought before the court without a writ, or unless it is shown that the condition of the patient makes it improper to bring him before the court, the probate judge must direct that he be brought before the court for a hearing. The hearing may not take place until the person alleged to be insane is notified.

Inquests in lunacy must be by jury or commission, at the discretion of the court. Inquests must be by the jury when it is demanded by the person alleged to be insane, or by any person acting in his behalf. In such cases the court must appoint competent counsel for the person alleged to be insane.

When no jury is demanded or a trial by jury is not expedient, the probate judge must appoint a commission of two qualified physicians in regular practice to make a personal examination of the patient and file with the probate court a sworn report of their findings. The commission has power to administer oaths and take sworn testimony. Inquests in lunacy may be in open court, or in chambers, or at the house of the person alleged to be insane; the presence of the accused is indispensable.

A jury of four persons, one of whom must be a physician who has been in regular practice for three years and of good standing, must be impaneled when a case is tried by jury. The person alleged to be insane must be present, represented by counsel, and may challenge jurors as in civil cases. The verdict must be signed by all members of the jury, and contain a brief statement of the medical treatment in the case, signed by the physician or physicians upon the jury. If the person is adjudged to be insane and a fit person to be sent to a hospital, the

court must order his commitment. If not satisfied with the findings of the jury or commission, the probate judge may set them aside, and dismiss the proceedings or order another inquest. The order entered by the judge in accordance with the findings of the jury or commission may discharge the patient with or without conditions or remand him to the custody of his friends, or commit him to some hospital, public or private, in the state, or to a county insane asylum or the insane department of a county almshouse in the county where the alleged insane person resides.

Insane persons may be committed to private hospitals or institutions in the same manner as to a state hospital for the insane, or on examination and certification by a physician chosen by the state board of administration. Such physicians are appointed in different parts of the state to serve during the board's pleasure and receive \$5 for each certificate.

The probate judge, in selecting a private asylum in cases adjudged insane in his court, must be governed by the wishes of the friends and relatives of the insane person. No county can recover for the care of an insane person confined in a private hospital unless he first has been refused admission to one of the state hospitals for want of room, and then only at the rate of \$2 a week.

Insane persons not residents of the state may not be detained in any private institution in this state unless committed in accordance with the laws of the state or territory of which they are residents or with the laws of this state.

Any person filing application for an inquest in the case of a person possessed of any estate may at the same time apply for the appointment of a guardian for him.

Having ordered an insane person committed to a state hospital, the probate judge must without delay make application to the board of administration for his admission, transmitting with the application a copy of the report of the examining physician and the verdict of the jury or commission, under his signature, and the board must designate the hospital to which he shall be conveyed.

(c) *Voluntary Admission.*

(d) *Appeal from Commitment.*—Appeals may be made to the district court from any order or judgment rendered, upon the appellant giving such bond and security as the court may direct. Appeal from commitment may be made on behalf of any person committed as insane, and the question must be decided by the probate court after inquiry, with or without a jury. Such inquiry may not be held oftener than once in six months in regard to the same person and not within six months of the time of the admission of any patient. (See 6. Parole and discharge of patients; habeas corpus.)

(e) *Cost of Commitment.*—In case of county patients, the costs must be paid from the county treasury; but in case of private patients, the costs must be paid by the guardian or relatives of the insane out of his estate. When a person is found to be sane, the court may re-

quire that the costs be paid by the person who filed the statement. When any person residing in the state is adjudged insane by the probate court of any county of which he is not a resident, the probate judge of the county in which the person resides must be furnished with a transcript of the record and findings in the case, whereupon the county becomes liable for the costs of proceedings, transportation, clothing and other incidental expenses of commitment.

**4. Conveying Patients to the Hospital.**—If any competent relative or friend of a person committed to a hospital for the insane requests the warrant of commitment, it must be delivered to him for service. In committing female patients to the state hospital, unaccompanied by some relative, the probate judge must appoint a female attendant to accompany the sheriff or other person to whom the warrant of commitment is delivered.

**5. Transfer of Patients. 6. Parole and Discharge of Patients.**—The board of administration may release patients on parole.

Authority to discharge patients from any of the state institutions for the insane is vested in the state board of administration, but may be delegated to the respective superintendents. Discharges may be made because the person is not insane, or because he has recovered, or because he has so far improved as to be capable of caring for himself, or because the friends of the patient request his discharge and in the judgment of the superintendent no evil consequences are likely to follow, or because there is no prospect of further improvement and the room is needed for others. No patient who is violent, dangerous, or unusually troublesome or filthy may be discharged from any state institution and sent back to any county farm, almshouse, or insane department of any almshouse not provided with suitable conveniences and facilities for his care. No patient who has not recovered his reason or who is charged with crime may be discharged until at least ten days after notice has been given to the probate judge to make some order in regard to the disposition of the patient.

Any relative or friend of a patient admitted to a private institution may apply for his discharge to its superintendent; and, in case the superintendent refuses to grant it, may apply to the probate court of the county where the institution is located, which court has authority to hear the application, and may discharge the patient or not.

Upon proper notice that a patient committed on his order has been discharged as cured, the probate judge must order the patient restored to all his rights as a citizen. At any time subsequent to the discharge of a patient not recovered, the probate judge of the county may hear the evidence tending to show that such patient has recovered, and if satisfied of his recovery, may make a similar order, and thereafter the patient is not liable to commitment to any hospital for the insane without a new inquest.

An insane inmate of a county asylum for the poor may be discharged by the county commissioners to friends who are willing and able to care for him.



A writ of habeas corpus may be presented by any person who, under any pretense, is restrained of his liberty.

7. **Cost of Maintenance.**—Patients committed to any state hospital for the insane must be designated either as private or county patients. The probate judge must transmit to the superintendent of the hospital a statement showing the financial condition of a patient committed by him, and of the persons bound in law to maintain him. Each county is entitled to receive from the state a sum not to exceed \$2 a week for each destitute insane person in the county whose admission to the state hospital has been refused for want of room or who has been discharged from the state hospital to make room for another patient. No private patient may be received into any state hospital for the insane unless there has been filed with the superintendent a bond with sufficient sureties, approved by the probate judge for the payment of all incidental expenses incurred by the institution on his account.

8. **Criminal Insane.**—When a person confined in the state penitentiary, the state industrial reformatory, or any other penal institution in the state is alleged to be insane, the warden, superintendent, or other person in charge, with the consent of the board in charge of the penal institution, must cause the person to be examined by the probate court of the county in which he is confined, as in the case of other insane persons. If he is found insane, he must be transferred by the order of the probate court to the state hospital for the dangerous insane. If his sanity is restored before the period of his commitment to the penal institution has expired, he must be removed to the institution from whence he came, there to complete the period of his sentence. The period for which he is removed is counted as a part of the term of the confinement. If the insanity continues after the expiration of his sentence, he must be detained in the hospital until his sanity is restored.

Any inmate of a state hospital or asylum for the insane or epileptic, or the home for feeble-minded found by the state board of administration to have homicidal tendencies, or to be under sentence or indictment or information, or whose presence is dangerous to the other inmates of said institution, must be transferred to the state hospital for the dangerous insane.

Any person under indictment or information found, by the court or by commission or another jury impaneled for the purpose of trying such question, to be insane, an idiot or an imbecile, must be forthwith committed to the state hospital for the dangerous insane for safe-keeping and treatment until he has recovered, when he must be returned to the court from which he was received to be placed on trial upon said indictment or information.

When during the trial of any person on an indictment, or information, evidence is introduced to prove that he was insane, an idiot or imbecile at the time of the commission of the offense and he is acquitted on that ground, the jury or the court must so state in the verdict and the court must thereupon commit him to the state hospital for the dangerous insane. No person thus acquitted may be liberated from the

hospital, except upon the order of the court committing him, and until the superintendent certifies that in his opinion he has wholly recovered.

## KENTUCKY

Authority:

Statutes of Kentucky, 1915

**1. Administration and Supervision.**—(a) *General.*—The state board of control consists of four members, two from each of the two leading political parties, appointed by the governor for a term of four years. Members of the board must be at least twenty-five years old, and have been citizens of the state for the last five years preceding their appointment. A bond of \$25,000 is required of each commissioner. Each member receives a salary of \$2500 a year and his necessary traveling expenses.

The board has under its control the three state hospitals for the insane and the feeble-minded institute. It must hold regular meetings at each of the institutions at least once in each month, and make a thorough examination of the affairs, management, property, clothing, food, supplies, condition of buildings and grounds, and the conduct of every official and employee, of which it must make a complete record, together with such rules and regulations as it may give. The board must ascertain whether the objects of the institutions are being properly accomplished and the laws in relation to them fully complied with, and make an annual report to the governor and a biennial report to the governor and general assembly.

The board of control must appoint at each hospital, for terms of four years, a medical superintendent, a first, second, and third assistant physician, each of whom must be a skilful and competent physician, who has practised his profession at least three years (provision is made for the appointment of a woman physician to each hospital) and a steward. The board may remove them for cause.

(b) *Institutional.*—There are no local boards of trustees for the state hospitals. The medical superintendent has the general management, supervision and control of the patients, subject to the regulations of the board of control. (His duties in regard to keeping records of patients, their condition, treatment, etc., are prescribed by law in detail.) He must make monthly reports to the board of control of the number of deaths among the patients, and their causes, and of all escapes, recoveries, and removals of patients. The superintendent appoints all inferior officers and employees not otherwise provided for and may remove any of them at pleasure.

**2. Care.**—(a) *In State Institutions.*—Eastern State Hospital, Lexington; established 1824; 1065 beds.

Western State Hospital, Hopkinsville; established 1854; 1200 beds.

Central State Hospital, Lakeland; established 1873; 1400 beds.

The statutes require that white and negro patients shall be cared for in separate departments.

(b) *In Local Institutions.*—Each county poorhouse must provide

for the care of the harmless incurable insane and such other patients as may not be received at the state hospitals. The poorhouses are under the control of the county courts.

**3. Commitment.**—(a) *Persons Committed.*—All insane persons, except idiots, epileptics, and the harmless incurable, having a legal settlement in some county are entitled to admission to the state hospitals for treatment at the state's expense.

All pauper idiots, epileptics, and harmless incurable insane persons, must be returned by the hospitals to the several counties from which they were sent and given into the custody of their friends if any; if not, then to the county judge, or, if they are residents of and sent from the city of Louisville, then to the mayor of that city who must make suitable provision for their support. The hospitals must also return each paying patient of the aforesaid classes to his county of residence, or whence he came.

When upon application to the proper hospital a patient is rejected for want of room, immediate application must be made to another. The board of control must take care that each of the hospitals is kept full to its utmost capacity of such patients as are receivable by it as long as any of them in the state are unprovided for. Resident patients always have preference over pay patients from other states, and any patient found insane must be received.

(b) *Legal Procedure in Commitment.*—Inquests to determine whether a person is of unsound mind (idiot, lunatic, non compos) must be held by the circuit court of the county. If no circuit court is in session in the county, the inquest may be held by a judge of a circuit court or by the presiding judge of the county court; but in no case may an inquest upon an idiot be held except in the circuit court. The judge may make all orders for the care of the person found to be of unsound mind or imbecile or incompetent to manage his estate, and must, if necessary, make all orders for the appointment of a committee and the security of the estate and care of the person in question. The judge holding the inquest may order a person found insane to the state hospital; but in no case may an order be made to send an idiot to a state hospital unless the jury, by their verdict, finds that he is so dangerous or uncontrollable that he cannot properly or safely be kept by a committee at home.

The personal presence of the person charged with being of unsound mind is required, unless it shall appear by the oath or affidavit of two regular practising physicians, that they have personally examined him and find him to be insane, and that his condition is such that he would be unsafe to bring into court. The case must be heard before a jury. If the judge is satisfied with the inquest, judgment must be entered accordingly, or he may order the inquest set aside if he finds it contrary to law or not sustained by the evidence, and order a new inquest.

Whenever it appears to the county or circuit court from an affidavit filed that a person found of unsound mind has been restored to



his proper senses, or that the inquest was false or fraudulent, the court must direct the facts to be inquired into by a jury in open court, and make all necessary orders or decrees in the premises.

When a person has been found to be insane, the presiding judge must endeavor to ascertain and draw up a brief history of the patient's case, covering certain specified points, and transmit the same to the hospital to which the patient is sent.

(c) *Voluntary Admission.*

(d) *Cost of Commitment.*—The expense of committing and transporting indigent patients is paid by the state unless they have sufficient estate.

**4. Conveying Patients to the Hospital.**—The circuit court or county judge ordering any person to be sent to a hospital for the insane must notify the superintendent, advising him of the sex and condition of the person, and the superintendent must immediately send a competent attendant to convey such person to the institution.

**5. Transfer of Patients. 6. Parole and Discharge of Patients.**—The superintendents of the several hospitals may permit the family or friends of patients, whose condition of mind and health is such that they may be taken care of and treated properly outside of the hospital, to be removed from it, either permanently or for such length of time as the superintendents may deem prudent. No patient may be discharged as cured except by the authority of the superintendent. Any cured patient who was admitted to the hospital while in custody or upon a criminal charge, must be delivered to the keeper of the penitentiary or to the jailer of the county whence he came. A cured pauper, before being discharged, must be furnished with clothes and enough money to pay his traveling expenses to his home.

**7. Cost of Maintenance.**—A pauper idiot or insane person, who has been found so by the verdict of a jury, or committed by order of court and who has no estate sufficient for his support and no relatives liable for his support, must be cared for in a state hospital at the expense of the state.

When the patients supported in the state hospitals acquire estates which can be subject to debt, the board of control must sue for and recover the amount of such patient's board at the rate of \$150 per year, or so much of it as the estate will suffice to pay. The board of control must sue for and recover from persons liable for the support of patients provided they have sufficient estates.

Pay patients are charged a fixed sum per annum to be paid in advance for the first six months, and security must be furnished for payment for the remainder of the time they may be in the hospitals. But if the patient be discharged or die before the expiration of the six months paid for, a proper proportion of the amount paid must be refunded.

**8. Criminal Insane.**—When the sanity of a person appearing for trial is questioned, or a defendant alleges insanity as a cause against judgment, a jury of twelve must determine the question. If found insane, the defendant may be kept in prison or county jail or conveyed

to the nearest state hospital at the discretion of the court. If sent to the state hospital, the accused must be returned to the sheriff upon demand.

A defendant acquitted on the ground of insanity may be committed by the court to a state hospital.

## LOUISIANA

Authority:

Marr's Revised Statutes of Louisiana, 1915

1. **Administration and Supervision.**—(a) *General.*—The state board of charities and correction consists of six members who serve without compensation, appointed by the governor for terms of six years. The governor is ex-officio chairman of the board. The duties of the board are strictly visitorial, without administrative or executive powers. It has the duty of inspecting all state or local charitable and correctional institutions. The board makes report to the governor annually and to each legislature.

(b) *Institutional.*—Each of the hospitals for the insane is governed by a board of administrators, consisting of eight members appointed by the governor with the advice of the senate from the state at large for terms of four years. The governor is ex-officio president of the boards. Each board has an executive committee of four members, which must visit its institution at least monthly.

The boards, which must hold at least four meetings a year and make a full report to the legislature at each session, make all rules and regulations for their own government; elect the superintendents of the hospitals, in one case to serve for four years; in the other, during good behavior; remove superintendents for cause; and determine the salaries of the officers. Superintendents name their assistant physicians and other officers, who are subject to removal by the boards upon their recommendation.

2. **Care.**—(a) *In State Institutions.*—East Louisiana Hospital for the Insane, Jackson; established 1846; 1460 beds (with a ward for criminal insane).

Louisiana Hospital for the Insane, Pineville; established 1906; 620 beds.

(b) *In Local Institutions.*—The police juries of the different parishes have the duty of caring for insane persons who cannot be received at the hospitals and may provide for them on poor farms or in homes.

3. **Commitment.**—(a) *Persons Committed.*—Indigent insane persons, residents of the state, are entitled to admission to the hospitals for the insane. The board of administrators has authority to receive patients not committed by a judge on such terms as it may fix.

(b) *Legal Procedure in Commitment.*—On written complaint or information of any respectable citizen to the judge of the district court that any insane person within his jurisdiction ought to be sent to one of the state hospitals for the insane, the judge must order the person to be brought before him, and summon two licensed and reputable

physicians, one of whom must be the coroner of the parish, and the other the physician of the suspected person, if he has any, neither of whom may be related by affinity or consanguinity to him or have any interest in his estate. The judge and the two physicians constitute a commission to inquire whether the person is insane and a suitable subject for a hospital for the care and treatment of insane persons; and for that purpose the judge must summon witnesses who know the person suspected of insanity. The physicians in the presence of the judge must by personal examination satisfy themselves and the judge as to the mental condition of the suspected person. If the two physicians do not agree, the judge determines the issue. (The recorders of the city court of New Orleans may, however, commit insane persons.) The coroner must ascertain all necessary facts to enable him to answer the questions prescribed in the form of certificate.

(c) *Voluntary Admission.*

(d) *Appeal from Commitment.*

(e) *Cost of Commitment.*—The expense of examining and conveying an insane person to the hospital is paid out of the parish treasury.

4. **Conveying Patients to the Hospital.**—Upon a warrant by the committing judge, the sheriff has the duty of conveying an insane person to the hospital.

5. **Transfer of Patient.**—The boards of administrators through their executive committees may in their discretion transfer inmates from one to the other hospital.

6. **Parole and Discharge of Patients.**—Authority to discharge patients upon recovery or for other causes is vested in the superintendents, subject to the order of the respective boards.

7. **Cost of Maintenance.**—Except that patients who are not committed by a judge may be received on terms fixed by the hospital boards, there is no charge for the maintenance of patients at the state hospitals.

8. **Criminal Insane.**—When a person arrested for a crime or misdemeanor before any court of the state is acquitted by the jury, or not indicted by the grand jury by reason of insanity, and his liberation is deemed by the court to be dangerous to safety, the court is authorized to commit him to the hospital for the insane or to a similar parish institution until he is restored to his right mind.

If any person charged by affidavit, information, or indictment with the commission of any crime is found to be insane before trial or after trial and conviction, the court must order him to be committed to the ward for the criminal insane until he has been completely restored to sanity. If any such person committed to the ward for the criminal insane, in the opinion of the superintendent, is not insane, or when he has been completely restored to sanity, he must be sent back to the jail or custody and held for trial, so that sentence may be executed upon him. The superintendent of the state hospital for the insane must, as often as the court requires, furnish information of the status of the criminal insane during his confinement.



When a convict serving a sentence in the penitentiary becomes insane, the general manager of the penitentiary must petition the court where the penitentiary is located for his removal to a hospital for the insane. The judge must hear and determine the question of the convict's insanity in the same manner and by such proofs as are required by the law for the interdiction of other insane persons. If satisfied that the convict has become insane during his imprisonment the judge must order his removal to the hospital for the insane. Upon recovery, the convict must be returned to the penitentiary, to serve out the unexpired portion of his sentence.

When any person confined in the ward for the criminal insane has recovered his sanity, who was not guilty of the crime with which he was charged because of insanity, the superintendent of the hospital for the insane must notify the clerk of the district court of the parish wherein the crime was committed, and the sheriff of that parish must return him to the parish for trial.

No person committed to a state hospital for the insane who became insane after his conviction for a crime punishable by imprisonment in the penitentiary or by death, may be restored to liberty upon regaining his sanity, but must be delivered to the custody of the sheriff of the parish wherein he was convicted in order that the sentence of the court may be executed. When any person charged with a felony necessarily punishable in the state penitentiary or by death, has been adjudged insane, before or after trial or conviction, and committed to a state hospital for the insane, he must not be discharged from the hospital for the insane or delivered into the custody of the proper sheriff until the superintendents of the two state hospitals for the insane and, in case of their disagreement, a physician appointed by the judge of the district court from whence the criminal insane person was committed, are satisfied after a thorough examination that he has been completely restored to sanity and may be discharged without danger to others.

## MAINE

### Authorities:

Revised Statutes of Maine, 1916  
Laws of Maine, 1917

**1. Administration and Supervision.**—(a) *General.*—The board of charities and corrections consists of five persons, at least one of whom must be a woman. The members are appointed by the governor, with the consent of the council, for terms of five years. They serve without compensation, but receive their expenses.

The board approves all rules and regulations governing the administration of state institutions. Meetings must be held quarterly and oftener if required. Yearly inspections must be made of each institution by a member of the board or an agent. Biennial reports must be made to the legislature and quarterly reports to the governor.

The state hospitals for the insane are under the management of a

committee of seven trustees, one of whom must be a woman, appointed by the governor with the advice and consent of the council, to hold office during the pleasure of the governor and council, but not for more than three years under one appointment.

In addition to the general care and management of the hospitals, the trustees are authorized to establish by-laws for their internal government and economy, and to appoint a superintendent, steward, and treasurer for each hospital, subject to the approval of and to hold office during the pleasure of the governor and council, and all other necessary officers.

Each hospital must be examined monthly by two trustees, quarterly by three, and annually by a majority of the full board, and at any other time when they deem it necessary, or the superintendent requests it.

A committee of two, with whom must be associated one woman, are appointed by the governor annually to visit both hospitals to ascertain the treatment given the inmates, and they must promptly report every instance of abuse or ill-treatment to the trustees and superintendent of the hospital.

(b) *Institutional*.—The superintendent of each hospital must, among other things, receive all patients legally sent to the hospital, unless the number exceeds the accommodations, and apportion the number of patients who can be accommodated in the hospitals among the towns, according to their population at the last census. When applications for admission exceed or are liable to exceed that number of patients, he must give preference to those from towns that have not their full proportion of patients in the hospital, and may reject others. When a person has been unlawfully committed, the superintendent must report the case to the trustees, and they may have the person removed to the town from which he was committed. The superintendent, at each monthly visit of the trustees, must report to them any inmate who was idiotic at the date of his commitment, and who has become so imbecile as to be beyond cure, and if he thinks that such inmate may safely be discharged, the trustees must order his discharge and removal to the town by which he was committed.

2. **Care**.—(a) *In State Institutions*.—Augusta State Hospital, Augusta; established 1840; 1000 beds.

Bangor State Hospital, Bangor; established 1901; 600 beds.

(b) *In Local Institutions*.—Harmless incurable and other insane who cannot be received at the state hospitals may be provided for at the town almshouses, which are under the care and management of the overseers of the poor of the town.

3. **Commitment**.—(a) *Persons Committed*.—All insane who are legal residents of a town are entitled to admission to the state hospitals for the insane.

(b) *Legal Procedure in Commitment*.—Parents and guardians of insane minors, if of sufficient ability to support them there, must within thirty days after an attack of insanity, without legal examination, send them to one of the hospitals and give to the treasurer the bond re-

quired, or they may send them to some other hospital for the insane within this period.

Insane persons, not thus sent to any hospital, are subject to examination. The municipal officers of towns constitute a board of examiners, and on complaint in writing of any blood relative, husband, or wife of an alleged insane person, or of any justice of the peace, they must immediately inquire into his condition, appoint a time and place for a hearing, and notify the person alleged to be insane. They must take the necessary testimony, and if they think such person insane, and that his comfort and safety or that of others interested will thereby be promoted, they must forthwith send him to either one of the insane hospitals with a certificate of insanity, and direct the superintendent to receive and detain him until he is restored or discharged. The patient may be committed to the insane asylum while the commissioners are acting upon the application.

To establish the fact of insanity the evidence of at least two reputable physicians given by them under oath before the board of examiners is required, together with a certificate signed by the physicians and filed with the board, the evidence and certificate to be based upon due inquiry and personal examination of the person in question.

The judge of probate in the several counties likewise has power to examine insane persons, and upon complaint in writing of any blood relation, husband, or wife of the alleged insane person, or of any justice of the peace, accompanied by the certificates of some reputable physician stating that in his opinion the person is insane, may immediately appoint a time and place for hearing the case within the town or city in which the person resides or is found. The judge of probate has power to summon witnesses, and if the person is found insane, the judge must forthwith send him to one of the hospitals for the insane, directing the superintendent to receive and detain him until he is recovered or is discharged. The registrar of probate must keep a record of the doings in each case and furnish a copy to any interested person requesting and paying for it. The municipal officers or the judge of probate first taking jurisdiction of a complaint have exclusive jurisdiction in the matter until the complaint is finally disposed of. In case of refusal to commit by one of these tribunals after notice and hearing, no complaint may be made to the other tribunal with reference to the same person within thirty days after the decision is recorded; and only after application to each of said tribunals and neglect or refusal for three days on the part of each to act, may further proceedings be taken.

(c) *Voluntary Admission.*

(d) *Appeal from Commitment.*—Persons liable for the support of a patient who has been in either hospital for six months and who has not been committed by the supreme judicial court and is not afflicted with homicidal insanity, may apply to the municipal officers of the patient's town for his release, if they think him unreasonably detained. If the application is unsuccessful, it may not be renewed until the



expiration of another six months. When the committee of visitors becomes satisfied that an inmate, other than one charged with or convicted of crime and committed by order of court, is unnecessarily detained, they must apply for a writ of habeas corpus; and if the judge issuing it is satisfied, after due hearing, that the inmate is not a proper subject for custody and treatment, he must discharge the inmate. When the superintendent of either hospital is in doubt as to the legality of the commitment of any person, he may apply to the judge of the municipal or police court of the city where the person is detained under commitment, asking for an inquiry and decree in the case.

(e) *Cost of Commitment*.—The town in which an insane person resided or was found at the time of his arrest is liable for the expense of his examination and commitment. Any town thus made chargeable may recover the amount paid for examination and commitment from the insane person, if he is able to pay, or from persons liable for his support, or from the town of his settlement. If he has no legal settlement in the state, the expenses must be refunded by the state.

4. **Conveying Patients to the Hospital.**—If a woman is committed to either of the insane hospitals, the magistrate committing her must, unless she is to be accompanied by a father, husband, brother or son, designate a woman to be an attendant or one of the attendants to accompany her.

5. **Transfer of Patients.**—The trustees may transfer any patients from one hospital to the other, whenever, in their judgment, the welfare of the patients or of either institution will be promoted thereby. The expense is to be paid out of the funds of the hospital transferring the patient and is a charge upon the person liable for the board of the patient. If the board of the patient is paid by the state, the expense of the transfer must be paid by the state.

The trustees are empowered to transfer feeble-minded persons from the insane hospitals to the school for feeble-minded, and insane inmates of that school to either insane hospital. A copy of the certificate of commitment to the hospital, together with a certificate of the superintendent declaring the patient to be feeble-minded and not insane, and a certificate signed by the secretary of the trustees of the hospital showing that they voted the transfer, authorizes the superintendent of the school for feeble-minded to receive the patient in the same manner as if he had been originally committed to this institution. The expense is paid as for other transfers.

6. **Parole and Discharge of Patients.**—The superintendent of any public institution used wholly or in part for the care of the insane, may permit any inmate temporary leave of absence in charge of his guardian, relatives, friends, or by himself for a period not exceeding six months. He may be returned by them or upon his own application within six months without a new commitment, and the liability of the state, the town, or obligator by bond for his support remains in full force upon his return. The period may be renewed by the superintendent.

A person committed to a hospital for the insane may be discharged by any justice of the supreme judicial court on satisfactory proof that his discharge will not endanger the peace and safety of the community; or the justice may, on application, commit him to the custody of any friend who will give bond to the judges of probate of the counties in which the hospitals are located, conditioned for his safe-keeping, and the payment of all damages which any person may sustain by his acts. And when, on satisfactory proof, he is again found to be insane and dangerous, any justice of the supreme judicial court may, by a precept stating the fact, recommit him to the insane hospital from which he was discharged.

At the annual meeting of the trustees they, with the superintendent, must make a particular examination into the condition of each patient, including patients committed while under sentence in the state prison or any of the county jails, and discharge any one so far restored that his comfort and safety and that of the public no longer requires his confinement. They may transfer to the care and custody of his relatives and friends applying therefor, on conditions, any patient not held under sentence whom they are satisfied will be properly cared for by the person making the application.

When the overseers of the poor of a town, liable for the expenses of examination of a patient and his commitment to either hospital, are notified by mail by the superintendent that he has recovered from his insanity, they must have him removed to their town, and if they neglect it for fifteen days the superintendent must have it done at the expense of the town.

**7. Cost of Maintenance.**—The officers ordering the commitment of a person unable to pay for his support, or becoming unable after commitment, must certify the fact to the trustees and that he has no relatives liable and of sufficient ability to pay for his support; in which case the town of his legal residence is liable for the cost of his examination and commitment, while the cost of his support at the hospital is chargeable upon the state.

When the friends of an insane person or others file a bond with the treasurer of the hospital in which he is confined, the state is not liable for his support, unless new action is had by reason of the inability of the patient or his friends longer to support him; and such action may be had in the same manner and before the same tribunal, as if he had never been admitted to the hospital.

Any town made chargeable for the commitment and support of an insane person at a hospital may recover the amount paid from the patient, if able, or from persons legally liable for his support, or from the town where his legal settlement is; but if he has no legal settlement in the state, the expenses must be refunded by the state.

If the trustees of the hospital find that any person or municipality is lawfully liable for the support of an insane patient, they must proceed to collect all sums which have been paid by the state to the hospital for board of the patient from the person or municipality law-

fully liable for his support, and thereafter the state is not required to pay for such support, so long as the liability of any person or municipality continues.

**8. Criminal Insane.**—When a person indicted for an offense or committed to jail on a criminal charge makes a plea of insanity, the justice of the court before which the case is to be tried may order him sent to one of the hospitals for the insane for observation and report by the superintendent of the hospital. When the grand jury omits to find an indictment against a person by reason of his insanity, they must so certify to the court; and when a traverse jury for the same reason acquits any person indicted, the court may commit him to the insane department of the state prison, or to either of the hospitals for the insane. Any person thus committed must be discharged by the court having jurisdiction of the case only on satisfactory proof that he will not endanger the peace and safety of the community. Upon proof that such person has again become insane and dangerous, any justice of the supreme judicial court may recommit him as insane. If a person convicted of any crime, in the supreme judicial court or in either superior court, is found insane when motion for sentence is made, the court may commit him to the insane department of the state prison, if the crime is punishable by imprisonment in this institution; otherwise the commitment must be to one of the hospitals for the insane. If, at the expiration of the period of commitment to the insane department of the state prison, the person has not recovered, he must be transferred to one of the hospitals for the insane.

Insane persons transferred from the insane department of the state prison to either of the insane hospitals, upon satisfactory proof that such detention in such hospital will have a bad influence on the other patients, may be returned by the order of the governor and council.

Insane inmates of the reformatory for women may be transferred to the hospitals for the insane by the Western Somerset municipal court, upon the application of the superintendent. The court must hold a hearing, give due notice to all parties, and have the inmate examined by two physicians.

The governor must appoint in each county a competent physician, a resident of the county, to act as an examiner of insane convicts in the county jail of the county. When a convict in the state prison or the county jail becomes insane or a convict whose sentence has expired is there detained as insane, the prison physician and the examiner in the county must be notified and must investigate the case. If the convict or person detained is found to be insane, the warden or keeper of the jail must apply to the proper court for a decree. If after hearing the sworn evidence of at least two reputable physicians not in the employ of the state prison or other state jails, the judge determines that the convict or person detained is insane, he must commit him if held in the state prison to the insane department of the state prison, and if held in one of the county jails, he must commit him to one of the state hospitals. The certificate of the judge stating



the town in which the prisoner or person detained resided is sufficient evidence to charge the town for the expenses of his support, if he is detained after the sentence on which he was originally committed has expired, but when his friends or others file a bond with the treasurer of the hospital in which he is confined, such town is not liable for his support. If a person so committed is restored or discharged before the expiration of the term of the sentence on which he was originally committed, he must be returned to the prison and serve out the remainder of his original sentence.

A friend of any person adjudged to be insane and committed to the insane department of the state prison under the foregoing proceedings, who believes him to be unreasonably detained, may apply in writing to any justice of the supreme judicial court, who must inquire into the case.

## MARYLAND

### Authorities:

Bagby's Annotated Code of Maryland, 1911  
Laws of Maryland, 1910, 1916

**1. Administration and Supervision.**—(a) *General.*—Four commissioners, appointed by the governor for terms of four years, together with the attorney-general, constitute the state lunacy commission. Two of the members must be physicians, graduates of some legally authorized medical college and must have been in actual practice at least five years consecutively just preceding their appointment. One of the physicians must have had at least two years' experience in the treatment of the insane. The commissioners serve without pay. They are required to hold monthly meetings.

The lunacy commission has supervision of all matters relating to the custody, care, and treatment of the insane; is required to do whatever may be possible to ameliorate and improve their condition and to secure them all their rights and privileges as involuntary wards of the state. The commission has full power to investigate all institutions, public and private, authorized to receive insane persons, and to call for such information as it may need. The secretary of the commission must visit all public and private institutions for the insane, including county almshouses or asylums at least once in six months, ascertain whether the laws governing the care of the insane are observed, and examine the condition of buildings and inmates, as well as records and methods of administration.

It is mandatory upon all officers of institutions for the insane to furnish the information required by the commission. Refusal to do so is punishable as a misdemeanor.

The commission has power to require written reports from all institutions for the insane and to require records of patients in the form it may prescribe. The commission must encourage scientific investigations by the medical staffs of the various institutions and may publish the results. The commission is required to make an annual report in detail to the governor.

The lunacy commission is required to divide the state into hospital districts for the proper care and custody of the insane.

All institutions for the care or custody of the insane must be licensed by the commission, except state or incorporated institutions and county almshouses, unless the latter receive patients for pay. On applying for license full plans of proposed institutions and other details required must be submitted to the commission. Upon its refusal to grant a license an appeal may be taken to the superior court of Baltimore or to the circuit court.

(b) *Institutional*.—The state hospitals are under the control of boards of managers of nine members each, appointed by the governor for terms of six years, who serve without pay. The boards appoint the superintendents and the other physicians and officers necessary for the management of the hospitals, and have power to remove them. The managers make all the rules and regulations for the government of the hospitals and are required to inspect them at stated intervals.

A board of visitors of five members, two of whom must be women, may be appointed by the lunacy commission for each county asylum and almshouse where insane are confined. The power of such a board is limited to inspection and recommendations to the lunacy commission, to which it must make monthly reports of visits.

No institution for the insane is authorized to hold more than five insane persons in confinement unless there is a physician in regular attendance.

2. **Care**.—(a) *In State Institutions*.—Spring Grove State Hospital, Catonsville; established 1797; 600 beds.

Springfield State Hospital for the Insane, Sykesville; established 1896; 1500 beds.

Crownsville State Hospital, Crownsville; established 1911; 500 beds (for negro patients exclusively).

Eastern Shore State Hospital, Cambridge; established 1912; 300 beds.

(b) *In Local Institutions*.—There are no local institutions for the insane, the state having made complete provision for their care.

3. **Commitment**.—(a) *Persons Committed*.—All insane persons are entitled to admission to the state hospitals for the insane.

(b) *Legal Procedure in Commitment*.—The county commissioners, and the supervisors of charities in the city of Baltimore, must cause indigent insane persons who have no relatives or others liable for their support to be sent, upon the written certificate of two qualified physicians, to the almshouse of the county or city to which they belong, or to a hospital or some other place better suited to their condition. If demanded by an alleged insane person or his relatives or friends, or on the request of the county authorities or of the supervisors of charity in Baltimore, the circuit court of the county or the criminal court in Baltimore must convene a jury to inquire into the insanity of the person concerned. If the authorities before whom the person is brought are not satisfied that he is insane, the state's attorney of the county or of the city of Baltimore must be notified and immediately bring the

question before the circuit court or the criminal court of Baltimore for determination. Relatives or friends of such insane persons may confine them and provide for them.

No person may be committed or confined in any institution for the insane except upon written certificate of two qualified physicians, made within one week after examination of the alleged insane person, stating his insanity and giving the reason for their opinion. It is unlawful for any physician to certify to the insanity of any person for the purpose of committing him to any hospital or institution for the insane, with which the physician may be in any manner connected or interested.

(c) *Voluntary Admission*.—The medical superintendent or chief officer of any institution for the insane, except almshouses, may receive voluntary patients who make application in writing, provided that the expense be borne by the person applying or by his relatives or friends, or provided that the county commissioners or supervisors of city charities of Baltimore consent to his maintenance as a public charge. No voluntary patient may be detained for more than three days after having given notice of desire to leave the institution unless he in the meantime has been legally committed. No person may be received or detained as a voluntary patient whose mental condition is such or becomes such that he cannot comprehend the act of voluntary commitment or is unable to request a discharge, or to give continuous assent to detention. Every voluntary patient must be reported to the lunacy commission, with a statement of his mental condition at the end of each three months of his residence in the institution.

(d) *Appeal from Commitment*.—The lunacy commission at any time when it believes a person confined in any institution as insane to be not insane, may bring the matter to the attention of the proper state's attorney who must apply to the proper tribunal for the writ of habeas corpus. After inquiry, the court must discharge the person if found sane, or order him returned to the institution if found insane.

(e) *Cost of Commitment*.—The expense of securing the commitment of insane persons is a charge upon the county from which they are sent.

4. **Conveying Patients to the Hospital**.—No female patient may be conveyed to any institution for the insane or transferred from such institution except when accompanied by some relative, friend, or nurse of the same sex, unless accompanied by her father, husband, or adult brother or son.

5. **Transfer of Patients**.—The lunacy commission may transfer acute or violent insane patients confined in a private institution to a state hospital at the expense of the county in which the patient is found.

6. **Parole and Discharge of Patients**.—Whenever in the opinion of the chief medical officer of any institution for the insane it may benefit a patient to be granted leave of absence or parole on trial, he may grant it for not exceeding six months, with the privilege of renewal for not over thirty days, upon application in writing endorsed by the relatives, friends, or other persons at whose expense the person was first committed,



and who must assume responsibility for his care. No subsequent extension of leave of absence may be made, and no patient may be again admitted to any institution who has been absent from it for more than sixty days, or for more than thirty days, in case the parole had not been extended as above provided, except under a new commitment. Any such patient may be returned by his friends or brought back by the duly designated officers of the institution at or before the expiration of the period of parole.

The superintendent or chief medical officer of every institution for the insane must discharge a patient, except one under criminal charge, if satisfied that he has recovered. He may also discharge any quiet and harmless patient who is not likely to show a further improvement, if he is satisfied that such patient will be properly cared for and supervised. He may not discharge any person whom he has reason to believe to be dangerous to himself and others, except upon the order of some competent court. The relatives or friends may remove a patient maintained at private expense at their discretion at any time; but in the case of a person believed by the superintendent of the institution to be dangerous to himself and others, he must give notice to those making the removal that the patient is dangerous, state his reason for this belief, and file a copy of such notice with the papers upon which the patient was committed.

**7. Cost of Maintenance.**—No person may be treated as an indigent in any home or hospital for the insane in the state, who possesses sufficient income for his support or who has relatives who are able to pay for it. When an insane person is not able to pay the whole cost of his maintenance, but may be able to pay for part of it, the supervisors of the city charities of Baltimore, and elsewhere the county commissioners, may designate the rate per week which shall be reimbursed to the county or to Baltimore city.

If an insane person is possessed of sufficient property to support him in any hospital or asylum for the insane, the court must appoint a trustee for the estate of such person under bond that will cause the insane person to be confined and supported in some hospital.

The expense for the care and treatment of all patients in the state hospitals for the insane is a charge upon either Baltimore city or the county sending them to the extent of \$100; the state treasury pays the balance of the cost of board, care, and treatment. When a patient is held to be a charge upon another county than the one made responsible for his maintenance in the first instance, the state comptroller must determine the patient's legal residence and issue orders accordingly. When a patient is not a proper charge upon any county he must be supported by the state.

**8. Criminal Insane.**—When a person indicted for a criminal offense alleges insanity and the jury finds him insane, the court trying the case must cause him to be sent to a hospital or some other suitable place, until he has recovered his reason. Any judge of the circuit court of any county where such a person is detained, or of the supreme bench

of Baltimore city may, upon habeas corpus proceedings, order absolutely or conditionally the permanent or temporary discharge of the person upon proof of temporary or permanent recovery. If a person arrested for any offense or charged with any crime appears to the court to be insane, the court may cause an inquiry by the lunacy commission and if they find the person insane the court must direct his confinement as above until his recovery.

The board of directors of the penitentiary or house of correction may summon the lunacy commission to examine into the mental condition of the convicts, and if a convict is adjudged insane or feeble-minded by the lunacy commission or the majority thereof and his removal seems advisable, the commission must make complaint to the judge of the criminal court of Baltimore or of one of the circuit courts, who has power to order the removal of the convict to a state hospital at the expense of the state.

## MASSACHUSETTS

### Authority:

Acts of Massachusetts, 1909, 1910, 1911, 1914, 1915, 1916, 1917

1. **Administration and Supervision.**—(a) *General.*—The general supervision of all institutions, public and private, for the insane, feeble-minded, epileptic, inebriates, and drug habituates (except one state hospital for inebriates) is vested in the commission on mental diseases, consisting of five persons appointed by the governor with the advice and consent of the council for terms of five years. The director and two associate members must be physicians and experts in the care and treatment of the insane. The director receives a salary fixed by the governor and council not to exceed \$7500; all members are reimbursed for expenses incurred in the performance of their duties. The director is the administrative and executive head of the commission. He appoints such agents and subordinate officers as the commission deems necessary and fixes their compensation subject to the approval of the governor and council.

The commission is required to make an annual report in regard to the work of each institution under its charge, including classified statements of receipts and expenditures and estimates of expenditures for the year ensuing. It is required to encourage scientific investigation by the medical staffs of the various institutions under its supervision and to publish from time to time bulletins and reports of the scientific and clinical work done. It has charge of the construction of all new buildings or new institutions and the selection of the site of any new institution and of any land to be taken or purchased for any new or existing institution. It must visit every institution under its supervision at least once a year and oftener if the governor so directs, and ascertain by actual examination and inquiry whether the laws relating to persons in custody or control therein are properly observed, give such directions as will insure correctness in the returns required, and use all necessary means to collect desired information. It must care-

fully inspect every part of each institution with reference to cleanliness, sanitary condition, number of patients in seclusion and restraint, dietary and other material matters, and offer every patient an opportunity for interview with its visiting members and agents. The commission is authorized to develop a state-wide system of psychopathic hospital service.

When so directed by the governor, the commission may assume and exercise the powers of the board of trustees of any state institution under its supervision in any matter relative to the conduct and management thereof. It has the same powers relative to state charges in institutions or other places, and of their property, as are vested in towns and overseers of the poor in the support and relief of paupers.

The commission has power to investigate the question of the insanity and condition of any person who is an inmate of any institution for the insane, public or private, or restrained of his liberty by reason of alleged insanity at any place within the commonwealth, and must discharge him, if he is not insane or can be cared for without danger to others, and with benefit to himself. All questions as to the sanity of inmates of the penal, reformatory, and other institutions must be referred to and determined by the commission, except as is otherwise provided by law.

The commission must prescribe the forms of application, medical certificate, and order of commitment required by law in the commitment of all insane; keep records of all commitments and admissions, etc. If the commission has reason to believe that an insane person is confined in an almshouse or other place at public charge or otherwise, it must cause application to be made to a judge for his commitment to an institution under its supervision.

The trustees or superintendent of any institution coming under the supervision of the state commission must furnish it all the information required and immediately notify it if there is any question as to the propriety of the commitment of any person received.

The commission and the boards of trustees of the state institutions under its supervision must meet semi-annually for consultation.

The commission on mental diseases may annually license any suitable person to keep a hospital or private house for the care and treatment of the insane, epileptic, feeble-minded, and of persons addicted to the intemperate use of narcotics or stimulants. The applicant applying for a license must be a duly qualified physician with practical experience in the care and treatment of such patients. Licenses expire with the calendar year, but may be renewed. For establishing or keeping such a hospital or private house without a license, unless otherwise authorized by law, the penalty is a fine of not more than \$500.

(b) *Institutional*.—Each state hospital is governed by a board of seven trustees, five men and two women, all of whom are appointed by the governor for terms of seven years. The trustees have charge of the general interests of the institution. With the approval of the



state commission on mental diseases they appoint the superintendent and treasurer. With the approval of the trustees the superintendent appoints the assistant physicians. The commission on mental diseases establishes by-laws for the appointment of other officers as well as the regulations necessary for the conduct of the institution. In each institution receiving female patients and having more than two assistant physicians, one of these must be a woman. The trustees must provide for a monthly inspection of the fire apparatus and for the drill of the officers and employees in its use. (The law requires that each institution shall have proper fire escapes and fire apparatus and receive a written certificate of approval in regard to these matters from the proper inspector of factories and public buildings.)

The boards of trustees of the various institutions must maintain an effective inspection of their respective institutions; must ascertain whether the affairs of the institution are conducted according to law and according to the rules and regulations established by the commission on mental diseases; must carefully inspect every part of the institution as a board or by committee with reference to cleanliness and sanitary condition, the number of persons in seclusion and restraint, dietary matters, and any other matter that may be considered worthy of attention; upon request of the commission on mental diseases must investigate any sudden death, accident or injury, whether self-inflicted or otherwise, and send a report to the commission; must personally hear and investigate the complaints and requests of inmates, officers, or employees. At least two of the trustees must visit the institution each month, a majority of them quarterly, and the whole board semi-annually, and they must make a written report to the commission on mental diseases whenever there are matters observed that need the attention of the commission.

Trustees have access to all books, records, and accounts pertaining to their respective institutions and must be admitted at all times to the buildings and grounds. They have power at any time to cause the superintendent or any officer or employee to appear before them to answer any question or to produce any books or documents relative to the institution.

Plans and specifications for the construction or substantial alteration of buildings, the site of any new building, the proposed taking or purchasing of any new land, and plans for the grading of grounds or substantial improvements at the institutions must be submitted to the trustees, and they must report thereon to the commission on mental diseases within a time fixed by the commission. New work cannot proceed until such report has been made or until the time fixed by the commission has expired.

2. **Care.**—(a) *In State Institutions.*—Worcester State Hospital, Worcester; established 1833; 1535 beds.

Boston State Hospital, Dorchester Center; established 1839; 1610 beds. (The Boston Psychopathic Hospital, established 1912, 110 beds, is a separate department of the Boston State Hospital.)

Mental Wards, State Infirmary, Tewksbury; established 1852; 731 beds.

Taunton State Hospital, Taunton; established 1854; 1315 beds.

Northampton State Hospital, Northampton; established 1856; 970 beds.

Grafton State Hospital, Grafton; established 1877; 1900 beds.

Danvers State Hospital, Hathorne; established 1878; 1485 beds.

Westborough State Hospital, Westborough; established 1883; 1260 beds.

Bridgewater State Hospital, State Farm; established 1886; 855 beds. (For insane criminals.)

Foxborough State Hospital, Foxborough; established 1891; 360 beds.

Medfield State Hospital, Harding; established 1896; 1645 beds.

Gardner State Colony, Gardner; established 1902; 785 beds. (For chronic insane.)

Metropolitan Hospital, Waverley; established 1914. (Not yet opened.)

(b) *In Local Institutions.*—The commonwealth has the care, control, and treatment of all insane, and no county, city, or town may establish or maintain any institution for the insane, or be liable for the board, care, treatment, or act of any inmate thereof.

(c) *In Families.*—Harmless patients of any institution for the insane other than those committed as inebriates may be placed at board in families by the commission on mental diseases or by the trustees of the institution. The commission must have all persons boarded out by it visited by an agent once in three months, and those boarded out by trustees visited once in six months, by an agent of the commission. The trustees must have all persons boarded by them in families visited once in three months.

The use of mechanical means of restraint may not be applied on any patient in any public or private hospital for the care or custody of the insane unless applied in the presence of the superintendent, or of a physician of the institution, or on his written order, which must be preserved in the records of the institution, and only in cases of extreme violence, active homicidal or suicidal condition, physical exhaustion, infectious disease, or following an operation or accident which has caused serious bodily injury, except in cases of emergency. But every emergency case must immediately be reported to the superintendent or to the physician or assistant physician of the institution, who must at once investigate the case, and approve or disapprove the restraint imposed.

The records of all restraint must be kept in a book open for inspection at all times by the trustees or other persons having control of the institution, the commission on mental diseases, the governor and council, and members of the general court. Restraint also includes therapeutic and chemical restraint and confinement in a strong room, or seclusion in solitary confinement.

The superintendent or head physician must keep personally under lock and key all implements or apparatus of restraint not in actual use.

The above provisions do not apply to the prolonged bath, to the hot or cold pack, or to medication when used as a remedial measure and not as a form of restraint.

Any one who knowingly violates this act is deemed guilty of a misdemeanor and may be fined not less than \$50 nor more than \$300 for each offense.

**3. Commitment.**—(a) *Persons Committed.*—All insane persons, except feeble-minded, are entitled to admission to state institutions for the insane. Insane epileptics are committed to the Monson state hospital, an institution especially for that class. Provision is also made for the commitment of female inebriates to hospitals for the insane.

(b) *Legal Procedure in Commitment.*—Judges of probate for the counties of Suffolk and Nantucket or a justice of a police, district, or municipal court (except the municipal court of the city of Boston) within his county, may commit to any hospital or institution for the insane, whether public or private, designated by the state commission on mental diseases, any person then residing in the county, who is a proper subject for treatment or custody. Except in the case of the absence or incapacity of the justice or in case of other emergency, no special justice of a police of the district or municipal court, may make a commitment.

Commitment may not be made unless there has been filed with the judge a certificate of the insanity of the alleged insane person by at least two physicians, nor without an order signed by the proper judge, stating that he finds the person committed to be insane, and either that he has been an inhabitant of the commonwealth for six months immediately preceding the finding, or that provision satisfactory to the state commission on mental diseases has been made for his maintenance, or that by reason of insanity he would be dangerous if at large. The order of commitment authorizes the custody of the insane person either at the hospital to which he is first committed, or at some other hospital to which he may be transferred. The judge must see and examine the alleged insane person if he deems it advisable to do so, and must certify to the residence of the person at the time of his commitment. The judge may call in a third physician when he deems it advisable.

A physician making a certificate of insanity must be a graduate of a legally chartered medical school, have been in actual practice for three years since graduation, and for the three years last preceding, and be registered in accordance with the laws of the commonwealth. His standing, character, and professional knowledge of insanity must be satisfactory to the judge. The physician must have examined the alleged insane person within five days of the certificate. A copy of the certificate, attested by the judge, must be transmitted to the superintendent of the hospital to which the insane person is committed,



who in turn transmits copies to the state commission on mental diseases. A certificate bearing date more than ten days prior to the commitment of a person alleged to be insane is void. No certificate is valid or may be received in evidence if signed by a physician holding an appointment, except in a consulting or advisory capacity, in the hospital for the insane to which the person is committed. A statement containing facts in the form prescribed by the state commission must be filed with the application and a copy sent to the superintendent of the institution.

An order of commitment is void if the patient is not received at the hospital within thirty days.

Within two days after the reception of an insane patient the superintendent must send notice of his commitment by mail to all persons whose addresses appear on the statement, or to any other two persons whom the patient may designate.

After hearing such evidence as he may regard as sufficient, the judge may cause the apprehension of the alleged insane person if it is necessary or proper to do so and place him in such custody or confinement as he sees fit.

The judge may summon a jury of six men to hear and determine whether the alleged insane person is insane. In such cases the judge shall have the same authority as the supreme judicial court to enforce the attendance of jurors and witnesses and to impose fines for non-attendance. The verdict of the jury is final.

The superintendent of any hospital for the insane may, without an order of a judge, receive and detain for not more than five days any person whose case is certified to be one of violent and dangerous insanity, or of other emergency, by two physicians qualified as provided by law. Officers entitled to serve a criminal process or any member of the district police must upon the request of the applicant or of the certifying physicians cause the arrest and delivery of such a person to the superintendent. The person applying for such admission must within five days cause the alleged insane person to be committed or removed from the hospital under a penalty of \$50 and liability to the hospital for the expense incurred.

If a person is found by two qualified physicians to be in such mental condition that his commitment to a hospital for the insane is necessary for his proper care or observation, he may be committed to a state hospital for the insane or to the McLean Hospital (a private institution), under such limitations as the judge may direct, pending the determination of his insanity.

All persons suffering from delirium, mania, mental confusion, delusions, or hallucinations who come under arrest or under the care or protection of the police of the city of Boston must be taken directly to the Boston Psychopathic Hospital in the same manner in which persons afflicted with other diseases are taken to a general hospital. If the admitting physician at the hospital finds after examination that the person is suffering from delirium tremens or drunkenness

the hospital need not admit him, but otherwise the hospital must admit, observe, and care for all such persons until they can be committed or admitted to hospitals appropriate in each particular case.

A person suffering from insanity or mental confusion, except delirium tremens and drunkenness, may not be placed in any jail or place of detention for criminals. If he has been so placed in a case of emergency he must be examined by a physician, given proper care, and not be detained for more than twelve hours. Any person not so placed, except in the city of Boston (where all such persons are to be taken to the psychopathic hospital), must be cared for by the board of health of the city or town in which he is found, which must have him examined by a physician and committed to an institution, unless he recovers or is suitably provided for by relatives or friends.

The superintendent of any public or private hospital for the insane may receive for temporary care, not exceeding ten days, any person suffering from mental disease, on the written application of any physician, member of the board of health or police officer in any city or town, an agent of the institution's registration department of the city of Boston, or member of the district police. The patient must be discharged, committed, or remain as a voluntary patient at the end of ten days.

Penalties are prescribed for wilfully conspiring to commit a person unlawfully to an institution for the insane as well as for the ill-treatment or neglect of any patient on the part of the hospital authorities or employees.

The relatives or friends of an insane person, or the mayor and aldermen of the city or the selectmen of the town in which he lives may apply to the probate judge for the appointment of a guardian for him after due notice has been given. An examination by physicians may be had. Upon application of any of the same parties a temporary guardian may be appointed for an insane person by the probate court, with or without notice of hearing.

(c) *Voluntary Admission*.—The superintendent of any institution to which an insane person may be committed may receive any person as a voluntary patient who makes written application, and is mentally competent to make it. A voluntary patient may not be detained for more than three days after having given notice in writing of his desire to leave the institution. Due notice must be given the commission on mental diseases of each case of admission of violent and of temporary and voluntary patients.

(d) *Appeal from Commitment*.—There is no provision for appeal from an order of commitment. But any person may apply to a justice of the supreme judicial court at any time for the discharge of a person whom the applicant believes ought no longer to be confined as insane. The alleged insane person may be brought before the justice at the hearing on a writ of habeas corpus. The case may be heard with or without a jury, and if it is found that the person is not insane or not dangerous, and ought no longer to be confined, he must be discharged.

(e) *Cost of Commitment.*—The expenses attending the committing and delivering of an insane person, epileptic, dipsomaniac, or drug habitué to a state institution are chargeable to the county in which commitment was made. If commitment does not result, the expenses incurred in seeking commitment are likewise chargeable to the county. All such expenses must be refunded the county paying them by the county of which the person in question is an inhabitant. But if the person was an inmate of a state institution at the time of his commitment or denial of application for the same, the expenses must be repaid by the county of which he was an inhabitant at the time of admission or by the county from which he was sent if he is without legal residence in any county. The expense of returning a patient on temporary leave must be paid by him or by his guardian, relatives or friends, if of sufficient ability, or may be paid by his county if a new commitment is necessary. The expenses of committing a pay patient are to be borne by the applicant or by a person in his behalf.

4. **Conveying Patients to the Hospital.**—If a woman is committed to an institution under the supervision of the state commission, the committing magistrate must, unless she is accompanied by her father, husband, brother or son, designate a woman to be an attendant to accompany her thereto.

5. **Transfer of Patients.**—The governor may at any time cause an inmate of a state institution under the supervision of the commission on mental diseases to be removed to another such institution as the circumstances of the case may require.

The commission on mental diseases may transfer any inmate to or from any institution under its supervision; but no person may be confined or transferred as insane unless duly committed by the court, or be confined in or transferred to the Bridgewater State Hospital unless the inmate has been a criminal and vicious in his life. The commission may remove any pauper inmates to any county, state, or place where they belong and may enter into agreements with commissioners of other states for the transfer of inmates from one state to the other. The commission may not transfer any person to or from a private institution except upon the application of the superintendent of such institution, nor transfer any voluntary inmate except with his written consent.

6. **Parole and Discharge of Patients.**—The state commission may permit a patient boarded in a family as an insane person to leave custody temporarily in charge of his guardian, relatives, friends, or himself for a period not exceeding one year, and may receive him again into custody when returned by the guardian, relatives, or friends, or upon his own application within this period without a new commitment.

The superintendent may permit any inmate temporarily to leave the institution in charge of his guardian, relatives or friends, or by himself for a period not exceeding twelve months, and may receive the inmate when returned. He may require as a condition of the



leave of absence that the person in whose charge the inmate is left must report the condition of the inmate. The superintendent or the person in whose charge the inmate is left may terminate the leave and request the return of the inmate to the institution.

The superintendent of any public or private institution, when authorized by his trustees, by the state commission on mental diseases, or on a written application, or a judge of probate for the county in which the institution is located or in which the inmate has his residence, or a justice of the supreme judicial court, after due notice to the superintendent, trustees, or state commission, may discharge any inmate if it appears that he will be properly cared for or that his detention is no longer necessary for his own welfare or the safety of the public. If the guardian or any relative of an inmate opposes the discharge, it may not be made without written notice to the person opposing it. The provisions of this section do not apply to persons committed by a court.

No unrecovered inmate who is known to have committed or attempted violence to others, or who is likely to become dangerous, may be discharged or given leave of absence without the approval of the commission on mental diseases. The commission may, if it cannot agree with the opinion of the superintendent in the case, file a petition for instructions in the probate court of the county in which the institution is situated, and may have the patient examined by one or more experts in insanity.

Pauper insane must upon discharge be provided with suitable clothing and money not exceeding \$20, at the discretion of the trustees. Inquiry must be made in regard to the future situation of every patient about to be discharged. No person may be discharged or paroled temporarily unless one of the hospital physicians has examined his mental condition within forty-eight hours of his departure.

**7. Cost of Maintenance.**—All indigent insane are maintained at the expense of the state. The trustees may make contracts for the support of inmates at a sum not less than \$6.00 a week. The price for the support of inmates not under orders of the court must be determined by the commission at a sum not exceeding \$6.00 a week and may be recovered from the person or relatives liable for the support, if of sufficient ability. The action for recovery must be brought by the attorney general. Any person making payment may bring an action for recovery or contribution from persons liable for the support of an inmate.

Any guardian or conservator who has property of an inmate exceeding \$200 in value who fails to make payment for the support of his ward in an institution within three months after receipt of a bill, may be removed upon the application of the attorney general.

**8. Criminal Insane.**—If a person charged with any crime is at the time appointed for trial or sentence, or prior thereto, found to be insane, or of such mental condition that his commitment to a hospital for the insane is necessary for the proper care and observation pending

the determination of his insanity, the court may commit him to a state hospital for the insane and must employ one or more experts in insanity to examine him. When, in the opinion of the trustees and superintendent of the hospital, he is restored to sanity, he must be returned to the custody from which he was removed, and held in accordance with the terms of the process by which he was originally committed.

If a person indicted for murder or manslaughter is acquitted on the ground of insanity, the court must order him committed to a state hospital for the insane during his natural life, and he may be discharged by the governor with the advice and consent of the council, when they are satisfied after an investigation of the state commission on mental diseases that it may be done without danger to others. Such a patient may be permitted by the superintendent, with the approval of the governor and council, to leave the hospital temporarily. The commission on mental diseases must designate two experts in insanity to examine, together with the prison physicians, the prisoners in the state prison or the Massachusetts reformatory or the reformatory prison for women, who are alleged to be insane, and report the result to the superior court of the county in which the prison is situated. The court may, if it considers the prisoner insane, order his removal, if a male prisoner, to the Bridgewater State Hospital; and, if a female, to one of the state hospitals for the insane, there to be kept until, in the opinion of the superintendent and the trustees of the hospital, he or she should be returned to prison. If a prisoner under sentence in a jail, house of correction, or prison other than those mentioned in the preceding paragraph, appears to be insane, the physician in attendance must make a report to be transmitted to the proper judge, who may order the prisoner removed to a state hospital for the insane. If a person so removed is restored to sanity, he must be returned to the prison or house of correction from which he was removed, to remain pursuant to the original sentence.

## MICHIGAN

### Authorities:

Howell's Michigan Statutes, 1913  
Laws of Michigan, 1917

**1. Administration and Supervision.**—(a) *General.*—The state board of charities and corrections is composed of four residents of the state, appointed by the governor for terms of eight years. The governor is ex-officio a member of the board.

The members of the board, or one of their number, or their secretary, must at least once a year visit and inspect state and local charitable and correctional institutions to ascertain their condition and management. They have authority to administer oaths and to examine any person connected with the institutions. They serve without pay and make a biennial report to the governor.

(b) *Institutional.*—Each of the state hospitals for the insane is under a board of trustees of six members appointed by the governor

for terms of six years and subject to removal by him. The psychopathic hospital is under the direction of a board of trustees composed of four members selected from the boards of trustees of the state hospitals for the insane and an equal number of the members of the board of regents of the state university. The state hospital for the dangerous and criminal insane is controlled by a board of trustees consisting of three members.

The government and exclusive control of the several hospitals is vested in the several boards of trustees, who serve without compensation. The boards have control of all the property, exercise general supervision, appoint medical superintendents, treasurers, and other employees, determine the salaries of employees, and establish rules. The boards of trustees meet jointly at least twice each year at the different hospitals to adjust all questions that may arise pertaining to their institutions; and the joint boards may transfer patients from one hospital to another if it becomes necessary or desirable.

The medical superintendent of each hospital, subject to the regulations established by the board of trustees, has general oversight of the institution, nominates co-resident officers, and appoints other assistants.

The Wayne county hospital for the insane is under the management of the board of county superintendents of the poor, consisting of seven members elected in the same manner as other county officials.

2. **Care.**—(a) *In State Institutions.*—Kalamazoo State Hospital, Kalamazoo; established 1848; 2250 beds.

Pontiac State Hospital, Pontiac; established 1873; 1600 beds.

Traverse City State Hospital, Traverse City; established 1881; 1700 beds.

Ionia State Hospital, Ionia; established 1883; 518 beds (for criminal and dangerous insane).

Newberry State Hospital, Newberry; established 1895; 1000 beds.

State Psychopathic Hospital, University of Michigan, Ann Arbor; established 1906; 60 beds.

(b) *In Local Institutions.*—Wayne county maintains an institution for the insane, known as Eloise Hospital, at Eloise. Patients are transferred from county to state charges as in the state hospitals, and Eloise Hospital maintains some 600 state patients. A few insane persons are cared for in the county infirmaries.

3. **Commitment.**—(a) *Persons Committed.*—All insane residents of the state, not feeble-minded or epileptic, are entitled to admission to the state hospitals.

The following classes of patients may be admitted to the state hospitals for the insane: (1) Public patients, maintained at the expense of the state; (2) private patients maintained without expense to the state; (3) voluntary patients who are not insane, and are maintained either at private or state expense.

A non-resident may be admitted to a hospital for temporary care, pending his return to his home; and boards of trustees must remove



any person admitted to a hospital who has not acquired a legal settlement in the state to the country or state to which he belongs.

(b) *Legal Procedure in Commitment.*—The father, mother, husband, wife, brother, sister, or child of a person alleged to be insane, or the sheriff, or any superintendent of the poor, or supervisor of any township, or any peace officer within the county in which an alleged insane person is found, may petition the probate court of the county for his admission to a hospital for the care of the insane. The petition must contain a statement of the facts upon which the allegation of insanity is based. The court must fix a day for a hearing and appoint two reputable physicians to make the required examination of the alleged insane person, whose certificate must be filed with the court on or before hearing and served personally, at least twenty-four hours before the hearing, upon the person alleged to be insane, and if made by a sheriff or peace officer, also upon the father, mother, husband, wife, or some one next of kin of the alleged insane person, residing within the county, and upon such of the relatives outside of the county and within the state as may be ordered by the court, and also upon the person with whom the alleged insane person may reside. The court may dispense with personal service or may direct substitute service to be made upon some person to be designated by it. In such cases the court must appoint a guardian *ad litem* to represent the insane person at the hearing. The court must institute an inquest as to the alleged insanity of the person, and in all cases take proofs in writing of the financial circumstances of his relatives legally liable for his support, and as to the person's legal settlement. If no jury is demanded, the probate court determines the question of the sanity or insanity. If the court deems it necessary, or if the alleged insane person, or any relative, or other person concerned demand it, a jury must be summoned to determine the question of insanity. If it appears upon the certificate of two legally qualified physicians to be necessary, the court may order the alleged insane person to be placed in the custody of some suitable person or to be removed to the state hospital of the district in which he resides, or to any hospital, home, or retreat pending the proceedings for commitment, but not for more than thirty days, except by special order of the court. The alleged insane person has the right to be present at the hearing. No person may be admitted to an institution under order of commitment after the expiration of thirty days from its date.

The board of trustees of the Traverse City Hospital may prescribe rules and regulations for the admission of patients.

Persons who are mentally disordered but regarding whom there is doubt as to their being insane may be committed, under the rules of the trustees, to the psychopathic hospital for observation for a period not exceeding thirty-five days.

No resident of the state may be held as a public or private patient in any hospital, public or private, or in any institution for the care or treatment of the insane, except upon certificates of insanity and an order for admission; provided, that a person adjudged to be so addicted

to the excessive use of intoxicating liquors or narcotics as to be in need of medical treatment and care, for whom a guardian has been appointed, may be restrained by the guardian in some suitable hospital or asylum; provided, further, that a judge of any court of record or police justice of any city or county may, upon a certificate of two legally qualified physicians, authorize any superintendent of the poor or peace officer of the city or county to remove to a hospital or other place of detention a person believed to be insane against whom no proceedings have been instituted and detain him until proceedings are instituted in the probate court. The period of such temporary detention must not exceed five days, unless by order of the probate court.

Certificates of insanity must be made by two reputable physicians, under oath, appointed by the probate court of the county in which the alleged insane person resides. The physicians must be permanent residents of the state, duly registered, have the qualifications prescribed by the laws of the state for the practice of medicine and surgery, and may not be related by blood or marriage to the insane person nor to the person applying for the certificate. Their qualifications must be certified by the clerk of the county in which they reside. Neither of the physicians may have any interest directly or indirectly in the institution to which it is proposed to commit the person. The physicians must make a personal examination of the alleged insane person enabling them to form an opinion as to his sanity or insanity, and no certificate of insanity may be made except after personal examination. Certificates of insanity must contain the facts and circumstances upon which the opinion of the physicians is based, and show that the condition of the person examined requires his care and treatment in a hospital for the insane. A copy of the physician's certificate together with a copy of the application for commitment of the patient must accompany the order of commitment.

When the state hospitals are unable to receive patients for lack of room, the court is authorized to order the admission of any person who has been adjudged to be insane as a public patient to any private hospital in the state with which a contract for the care and maintenance of public patients has been made. If relatives or friends request it, the court must order his commitment to a private institution for the insane.

(c) *Voluntary Admission*.—All residents of the state who are afflicted mentally, or with serious nervous disability, but who are not insane, may be admitted to the hospitals as voluntary patients, at the discretion of the medical superintendent and under special agreement, when there is room. No order of probate court is necessary for such admission. In the case of any voluntary patient, a certificate, signed by two reputable physicians having the qualifications prescribed by law, stating that the person needs hospital treatment, but is not insane, must be presented to the medical superintendent. The certificate must be accompanied by a certificate from the county clerk. Voluntary patients may be discharged at any time by the medical superintendent. Indigent

patients may be admitted as voluntary patients. If any voluntary patient in any hospital of this state is believed to be insane, he may be admitted to a hospital as insane by order of the probate court in the county in which he lives after the prescribed legal proceedings.

(d) *Appeal from Commitment.*—Anyone in custody as an insane person in any hospital, home, or retreat is entitled to a writ of habeas corpus upon a proper petition to the circuit court of the county of which the hospital, home, or retreat is situated, made by him or some friend in his behalf.

(e) *Cost of Commitment.*—The expenses of committing a person to a hospital, including the cost of transportation, necessary clothing, etc., are paid by the county of which the person is a resident, if he has no estate out of which it can be collected.

4. **Conveying Patients to the Hospital.**—The judge of probate may appoint a proper person to convey an insane patient to the hospital. A female patient must be accompanied by her father, brother, husband, son, or a female attendant.

5. **Transfer of Patients.**—The medical superintendent of any hospital for the insane must apply to his board of trustees for authority to transfer any insane person or person under treatment and supported by the state who exhibits dangerous or homicidal tendencies to the hospital for the dangerous insane.

6. **Parole and Discharge of Patients.**—The superintendent of a hospital may grant a parole to a private patient for not more than thirty days under conditions prescribed by the board of trustees.

Medical superintendents may discharge patients who have recovered as well as those who are not detrimental to public welfare. When a superintendent is unwilling to discharge an unrecovered patient upon request, the probate court of the county from which the patient was admitted into the hospital may, after a hearing has been accorded the superintendent, direct the discharge of the patient, upon such security as the court may require. A patient who has been discharged by the medical superintendent may, with his approval, be readmitted to the hospital under the original order of admission at any time within six months after the date of the discharge, but thereafter only upon a new adjudication of insanity and order for admission.

No patient may be discharged without suitable clothing, and money not exceeding \$25 for his necessary expenses until he can reach his relations or friends, or his employment to earn a subsistence.

When any person adjudged insane is discharged from custody and not again received into any hospital, home, or retreat, petition may be presented to the court for an order declaring him restored to soundness of mind. The court must fix a time for hearing the case. The testimony of at least two reputable physicians, establishing the sanity of such person, is required. (See 3 (d) *Appeal from Commitment*; *habeas corpus*.)

7. **Cost of Maintenance.**—If a bond for the support of an insane person is executed by at least two persons approved by the probate



court, together with the required advance payment toward his support, his admission must be ordered as a private patient; otherwise, as a public patient. The county in which the proceeding is had is liable to the state for the support of the patient until the bond and advance payment are delivered to the medical superintendent. At the request of the medical superintendent the court must require the persons executing the bond to justify their responsibility anew or order that a new bond be given, and unless this be done the insane person is to be regarded as a public patient. In case the admission of the insane person is ordered as a public patient, then the county of which he is a resident is liable to the state for the support of such patient for one year. If a public patient has an estate out of which the state may be reimbursed for his maintenance, the court must direct such payment out of his estate for the cost of his maintenance at the hospital as it deems just. The court on making an order of commitment may appoint a temporary guardian for an insane person until a guardian both of his person and estate can be regularly appointed.

**8. Criminal Insane.**—When a person accused of crime has escaped indictment, or has been acquitted upon trial, upon the grounds of insanity, the court must inquire whether his insanity in any degree continues, and, if it does, must order him to be sent to the state hospital for the dangerous insane. All persons who are adjudged insane, and previously have been convicted of crime, or at the time of such adjudication are in confinement on a criminal charge, must be admitted to this hospital. If any such person has been admitted to any of the other hospitals, the medical superintendent thereof may have him removed to the above hospital.

All persons who are adjudged insane, and who before such adjudication have been convicted of crime or are patients in the state hospital for the criminal insane, or who at the time of such adjudication are confined on a criminal charge, must be admitted to the state hospital. If any such person is admitted to any of the other hospitals the medical superintendent may cause him to be removed to the state hospital for the dangerous insane where he shall be received and admitted as a patient.

When a physician of the house of correction, reformatory, or state prison certifies to the officer in charge that an inmate is insane, the officer if satisfied that the inmate is insane must cause him to be transferred to the state hospital for the criminal insane. When recovered, he must be returned to the institution from which he came. If the patient continues insane after the expiration of his sentence, application must be made within five days to the judge of probate for the patient's commitment and retention in the hospital; but such a convict must be delivered to friends if they give surety approved by the governing board for the patient's maintenance and good behavior.

## MINNESOTA

## Authorities:

General Statutes of Minnesota, 1913

Laws of Minnesota, 1917

**1. Administration and Supervision.**—(a) *General.*—The state board of control is composed of three members, appointed by the governor, for terms of six years. Each member of the board receives a salary of \$4500 per annum, and must devote all his time to the duties of the board.

The board of control has exclusive management of the hospitals and asylums for the insane, including full authority in all financial matters. The board may appoint a purchasing agent for each institution, and must appoint a chief executive officer for each, subject to removal for misconduct or incompetency. The board determines the compensation of all officers and employees, except when it is fixed by law, and prescribes regulations in regard to the duties of the employees under its control and methods of accounting and keeping records. Each hospital and asylum for the insane must be visited by a member or the secretary of the board once in each month. The board may appoint a competent woman to visit and report upon such institutions. The board must prepare for the use of the legislature biennial estimates for appropriations necessary for the support of the hospitals and asylums and for extraordinary expenditures for buildings and other improvements. It must keep records showing the residence, sex, age, and other facts in regard to each patient in each of the institutions under its control, together with full information about their condition upon discharge and other similar information. To secure uniformity in the examination and commitment of the insane, the board prescribes the forms of blanks that are used.

The board must gather and disseminate information about the best methods of caring for the insane, encourage scientific investigation in the hospitals, and publish the results. The board is required to make a biennial report to the governor in detail.

(b) *Institutional.*—There are no local boards of trustees. The superintendent of each hospital or asylum has authority to appoint and discharge all assistants and other employees required for the management, subject to the consent of the board of control. Each superintendent is required to make an annual report in prescribed form to the board of control.

**2. Care.**—(a) *In State Institutions.*—St. Peter State Hospital, St. Peter; established 1866; 1300 beds.

Rochester State Hospital, Rochester; established 1877; 1200 beds.

Fergus Falls State Hospital, Fergus Falls; established 1890; 1600 beds.

Anoka State Asylum, Anoka; established 1900; 900 beds.

Hastings State Asylum, Hastings; established 1900; 760 beds.

Willmar State Asylum, Willmar; established 1917; 100 beds.

In connection with each of the first three hospitals there is a deten-

tion hospital in which patients are received for voluntary treatment or for examination before final commitment. Insane persons are received also at the Hospital Farm for Inebriates at Willmar. The criminal insane, insane criminals, and other dangerous insane persons are cared for at the asylum for the dangerous insane, a building maintained in connection with the state hospital at St. Peter.

(b) *In Local Institutions*.—Practically no insane are maintained at the county poorhouses.

(c) *In Families*.—Whenever the superintendent of a hospital reports to the board of control that any insane person under his charge is incurable or not likely to be further benefited by treatment, that he may be safely cared for in a private family, and that his own family is not able to support him, the board may authorize the superintendent to place him in a suitable private family, at an expense not exceeding \$3 per week. The superintendent, or some one delegated by him, must visit such patient once in three months, and may at any time direct his return to the institution.

3. **Commitment**.—(a) *Persons Committed*.—All insane persons who have a settlement in a county, town, city, or village must be admitted to an institution for the insane, except that the board of control may authorize admission when the residence is not ascertained or when circumstances make admission advisable. When application is made to a judge of probate for the admission to any hospital or asylum, and he finds that the person by whom the application is made has no residence or that his residence cannot be ascertained, he must report to the board and may recommend that the person be admitted notwithstanding. If the board finds that the person has a legal residence in another state, it may have him returned to it.

(b) *Legal Procedure in Commitment*.—When any person who is a resident of the state is supposed to be insane, any relative, guardian, or reputable citizen of the county in which the person resides or is found may file a certified petition in the probate court. The court may issue a warrant directing the person to be brought before the court for examination.

The county attorney, upon an order from the court, must appear in behalf of the person to be examined, and the court must appoint two licensed physicians, who with the probate judge constitute a board to examine the person and determine as to his insanity. If the person is obviously insane, the probate judge may dispense with the board of examiners, and may hear and determine the matter, if the county attorney consents.

When the examination is completed, the board must determine whether the person is insane, and report the proceedings to the court upon forms authorized by the board of control. If the person examined is found to be insane, the court must commit him to the custody of the superintendent of the proper state hospital or to the superintendent or keeper of any private licensed institution for the care of insane persons.



The probate judge, with the approval of the county board, may provide a place of temporary detention for the insane, making the necessary contracts, but may not erect a hospital for the purpose. All necessary expenses of such temporary detention shall be paid by the county. When the probate judge is unable to act, all of his duties may be performed by the court commissioner.

When the health or condition of a child under seventeen years of age requires it the court may cause the child to be placed in an institution for treatment and special care.

Each person found to be insane, except the criminal insane, may be committed to the proper detention hospital, to be kept and treated until the superintendent determines and certifies either that he is not insane or that he is a fit subject for a state hospital for the insane. If he is found to be sane, he must be discharged, as provided by law in other cases. If after a reasonable time the superintendent deems him a fit subject for a state hospital or asylum, and so certifies to the state board of control, it must transfer him to a hospital or asylum.

Any husband, wife, parent, son, daughter, or guardian, believing his wife, husband, father, son, daughter, mother, brother, sister, or ward to be afflicted with mental disease for which such person should be treated at a detention hospital, may apply to the judge of probate of the county in which the patient is a resident for the appointment of a board of three physicians, one of whom must be the family physician, if there be such. The judge of probate of the county must immediately appoint such board to determine whether the patient is in need of treatment at a detention hospital; and if a majority of the board so determines, the patient may be placed in the detention hospital by the relative who must sign the necessary application therefor, in the same manner and under the same restrictions and provisions as for detention in the hospitals for the insane. When information is filed with any judge of probate that a resident of his county is in need of treatment at a detention hospital, he must make proper investigation, and, if it substantiates the information filed, at once appoint a board to determine whether the proposed patient is in need of the treatment, and if he so determines, the patient must be placed in a detention hospital under the same restrictions that govern voluntary admissions.

At each city or village where a state hospital for the insane is located, a state hospital commission, composed of three reputable persons, at least one of whom is a duly qualified physician, must be appointed by the judge or judges of the district court of the county in which the detention hospital is situated, to hold office for two years. The commission has power to examine alleged insane persons and determine whether they are insane. The state hospital commission must meet at the detention hospital as often as may be requested by the superintendent thereof, but not oftener than twice each month, except in cases requiring immediate action.

(c) *Voluntary Admission.*—Any person believing himself to be

afflicted with mental disease and desiring to receive treatment at a detention hospital may voluntarily place himself therein. Before being admitted, he must make and sign a written application as provided by the board of control. When an application has been signed in presence of two witnesses, not officers or employees of the detention hospital, and delivered to the superintendent, the applicant may be received into the hospital for treatment. The superintendent is authorized to continue the detention of such a patient when in his judgment the condition of the patient requires it. Should the patient demand his release from the hospital and it is deemed unsafe, the superintendent must within three days call in the state board of control to take charge of the case and determine whether the patient is insane. If adjudged insane, he must be committed to the hospital. If found to be sane, he must be required to leave the hospital.

Any person who is defective and desires to receive treatment at a state institution may voluntarily make application to the state board of control for admission under the rules of the board.

The superintendent of the institution may detain any voluntary patient in the same manner as other patients, unless the person is ordered discharged by the court. If the person demands his release and the superintendent deems it unsafe to discharge the person, a petition for commitment must be filed in the probate court by the superintendent within three days.

(d) *Appeal from Commitment*.—Every person restrained of his liberty may prosecute a writ of habeas corpus. Application for such writ must be by petition to the supreme court, or to the district court of the county within which the petitioner is detained.

(e) *Cost of Commitment*.—The expenses of the examination and commitment of an insane person are chargeable to the county of which he is a legal resident. In case of dispute, the board of control determines the question of residence.

4. **Conveying Patients to the Hospital**.—It is the duty of the sheriff of the county, together with such attendants as shall be designated by the judge of probate, to convey an insane patient to the hospital.

5. **Transfer of Patients**.—The board of control may transfer patients from one hospital or asylum for the insane to another or to and from the school for feeble-minded.

6. **Parole and Discharge of Patients**.—Whenever he deems it advisable, the superintendent may allow a patient to be absent on parole for a period not exceeding six months. The order of commitment remains in force until he is legally discharged, and he may be recalled at any time. The state board of control must so far as possible exercise supervision over paroled patients and may for that purpose appoint one or more state agents. It may also appoint suitable persons in any part of the state for the same purpose. No one may be appointed as such agent who has not had at least a year's experience in caring for patients at a hospital for the insane.

The superintendent may discharge any patient certified by him to be recovered, except those charged with or convicted of some criminal offense. In all other cases patients must be discharged by the board of control. When discharged, a patient must be provided with sufficient money to defray his expenses to his destination.

When in the judgment of the superintendent of the detention hospital any patient, either voluntary or otherwise, has recovered, he must be required to leave the institution. If the superintendent is of the opinion that the patient is insane and that longer treatment in the detention hospital will be of no benefit, he must report the case to the state hospital commission. If adjudged insane by this commission, the patient must be committed as provided; if adjudged sane, he must be required to leave the institution.

Any person alleged or found to be insane may be paroled in the care of relatives or friends, but the probate judge, or the superintendent if the person has been committed to a hospital, may require a bond from them for the care and safe-keeping of the person; but no person charged with or convicted of a crime shall be so paroled.

Whenever any person committed to a hospital for the insane under this act is discharged or transferred to another institution, the superintendent must so notify the probate judge of the county from which the person was committed.

**7. Cost of Maintenance.**—Whenever a person committed by a probate court has been received by a state hospital, the judge or clerk of the court must notify the board of control, sending a copy of the commitment proceedings. The superintendent of the hospital must investigate into the estate of every patient received, also that of the relatives or guardian, and report to the board of control.

It is the duty of the judge of probate and county attorney to inquire fully into the property and estate of persons committed and of persons liable for support, and to report, with recommendations as to the extent the estate or relatives should be held liable, to the board of control.

For the maintenance of each inmate of a state institution for the insane the state has a valid claim of \$10 a month against the estate of the patient, or against the spouse, children, and parents in the order named. If it deems it advisable, the board may relieve the estate and the relatives from a portion or all of the liability. The board may bring suit against the estate or relatives if payment is not made within thirty days after demand.

The board is fully empowered to investigate the estates of persons liable for the support of inmates of state hospitals. If the board is unable to collect, the prosecuting attorney of the proper county shall, when directed by the attorney general at the request of the board of control, collect or bring suit in the name of the state.

Any patient or his friends or relatives may pay the full cost of maintenance or any portion of the cost of maintenance in excess of the minimum charge of \$10 a month.



If a deceased patient leaves no spouse, children, grandchildren, or parents, the state may support a claim for maintenance against his estate at the rate of \$120 a year for the time he was a patient, credit being allowed for any sums that may have been paid as well as for time away from the hospital on parole.

8. **Criminal Insane.**—When any person under indictment or information before or during trial is found to be insane, an idiot, or an imbecile, and to have homicidal tendencies, the court in which the indictment or information is filed must commit him to the asylum for the dangerous insane, there to be kept and treated until he recovers, when he must be returned to the court from which he was received.

Whenever any person confined in the state prison or any other penal institution is alleged to be insane, the warden must notify the state board of control, which must have the prisoner examined by the probate court of the county where he is confined. In case he is found insane, he must be transferred by the order of the court to the state asylum for the dangerous insane. If, in the judgment of the superintendent, his sanity is restored before the period of his commitment to the penal institution has expired, he must be removed by the state board of control to the institution whence he came, and there complete the period of his sentence.

## MISSISSIPPI

### Authority:

Code of Mississippi, 1906

1. **Administration and Supervision.**—(a) *General.*—Mississippi is without a state board having general supervision or control of charitable institutions.

The state hospitals for the insane are under the control and management of a board of trustees of five members, of whom at least three must be physicians, appointed by the governor for terms of two years. The governor is ex-officio president of the board.

The board must visit each hospital twice a year, and the governor, or the chairman of the board, or a majority of the board, may order a visitation at any time, but without making their coming known to the authorities of the hospital in advance. At each visitation the trustees must examine the hospital register showing the diagnosis of the case of each patient made by the superintendent, if the patient was admitted to the hospital since the last visitation. They must examine the journal of the daily treatment of each patient kept by the head nurse of each ward, and examine each patient. They must inquire into the competency and efficiency of all appointees and employees and make full report in writing to the governor, with recommendations which they consider will improve the management and the condition of the patients. They may order the dismissal of an employee without further inquiry, but in the case of an appointee must give him a hearing before dismissal.

(b) *Institutional*.—The superintendent of the hospital, who must be a skilled physician, is appointed by the governor for a term of four years. The governor may remove him for proper cause.

2. *Care*.—(a) *In State Institutions*.—Mississippi State Insane Hospital, Asylum; established 1855; 1550 beds.

East Mississippi Insane Hospital, Meridian; established 1889; 600 beds.

Both hospitals are required by the statutes to provide special wards for the negro insane.

(b) *In Local Institutions*.—The board of supervisors of each county is responsible for the maintenance of the indigent insane who cannot be received into the state hospitals or who are harmless incurables, and may provide for them in the poorhouses which are under their control. The supervisors must also furnish temporary care of insane persons pending an inquest.

3. *Commitment*.—(a) *Persons Committed*.—All insane persons, who are bona fide residents of the state and have not been brought into the state as insane within five years, and the latter in special cases by the consent of the governor, must be admitted to the state hospitals free of charge. Mere idiots, fools, and non-curables, who are not dangerous, are excluded from the hospitals.

(b) *Legal Procedure in Commitment*.—The chancery courts have jurisdiction of writs of lunacy, to be exercised by the clerks at any time, subject to the approval of the court. Any relative of a lunatic, or insane person, may have him so adjudged; but if his relations and friends neglect or refuse to place him in an insane hospital and permit him to go at large, the clerk of the chancery court must, on the application in writing and under oath of any citizen, direct the sheriff by a writ of lunacy to summon the alleged insane person to contest the application, and six freeholders to sit at the hearing. The result of the inquisition must be returned to the clerk. The jury must be charged by him to make due inquest (the particulars being prescribed by law). If the person is adjudged a lunatic or insane by the jury, or a majority of its members, and the jury finds that he should be confined, the clerk must direct the sheriff to arrest him and place him in one of the insane hospitals if there is a vacancy, and, if not, to confine him in the county jail pending such vacancy. The superintendent must obtain all the available facts relative to the insanity of each patient admitted on an adjudication of insanity; and the board of trustees must prescribe suitable regulations in regard thereto.

(c) *Voluntary Admission*.—On application for admission to an insane hospital made on behalf of an insane person who is a resident of the state, the superintendent and trustees may admit him to the hospital, although he had never been adjudged insane, and, if the person be in fact insane, they have authority to detain him. Before his admission the person making the application must present to the superintendent a sworn certificate from two licensed, practising physicians, and one respectable citizen who is personally acquainted

with the alleged insane person, all of whom must be residents of the same county in which he resides. Upon receipt of such application and certificate, the superintendent must forward to the physicians blank forms to be filled out giving the history of the patient, form of insanity, and such other information as may be required.

(d) *Appeal from Commitment.*—The writ of habeas corpus extends to all cases of illegal confinement or detention by which any person is deprived of his liberty, or by which the rightful custody of any person is withheld from the person entitled thereto, except in cases expressly excepted.

(e) *Cost of Commitment.*—The costs of an inquest and the removal to and from the hospital are to be paid by the estate of the insane person, and if he have none, by the persons required by the pauper laws to support him. The county of the legal settlement of an insane person is liable for all the expenses incurred and paid by another county.

4. **Conveying Patients to the Hospital.**—It is the duty of the sheriff to place persons adjudged insane in one of the hospitals if there is a vacancy; if not, to confine him in the county jail until there is room.

5. **Transfer of Patients.** 6. **Parole and Discharge of Patients.**—A patient who is found to be incurable but harmless, and who can properly be cared for outside of the hospital, and a patient who has recovered, must be discharged. When a patient is restored to reason, the superintendent of the hospital may furnish him transportation to his home and make requisition on the board of supervisors of his county for the costs. The superintendent must discharge a person found to be sane, although judged insane and confined in the hospital, and give him a certificate of sanity, a duplicate of which must be sent to the sheriff of the county. (See 3 (d) Habeas corpus.)

7. **Cost of Maintenance.**—The expense of maintaining indigent insane in hospitals is borne by the state. But if an insane person has an estate more than sufficient for the support of his dependents, his guardian must pay the patient's board in advance for six months and deposit enough money to provide him with clothing. For pay patients the cost is \$250 a year in advance. The person securing the admission of a pay patient must furnish a bond of \$15,000 conditioned to make such payments annually for five years unless the person dies or is removed.

8. **Criminal Insane.**—When a person indicted for an offense is acquitted on the ground of insanity, the jury rendering the verdict must so state, and also whether the accused has since been restored to his reason, and whether he be dangerous to the community; and if the jury certify that he is still insane and dangerous, the judge must order him to be confined in one of the state hospitals for the insane.



## MISSOURI

## Authorities:

Revised Statutes of Missouri, 1909

Laws of Missouri, 1911

1. **Administration and Supervision.**—(a) *General.*—The state board of charities and corrections consists of six persons, two of whom must be women and, of the remaining four, not more than two may belong to the same political party, appointed by the governor, who is ex-officio a member of the board, for terms of six years. The governor may remove members of the board for cause.

The board has power to investigate the whole system of charities and correction and must examine the condition and management of all state, county, and municipal charitable and penal institutions. Officers of the various institutions must furnish the board such information as it demands. The board must make a full report biennially to the governor.

(b) *Institutional.*—The state hospitals are under the management of boards of managers of five members each, appointed by the governor for terms of four years. The managers have the care and control of all the property of the institution and general responsibility of its management. They appoint the superintendent, assistant physicians, treasurer, steward, and may remove any officer except the superintendent at pleasure, and may remove the superintendent for incompetency or any misconduct. They prescribe the duties of the different officers and fix the terms thereof.

The superintendents of the several state hospitals must be physicians of acknowledged skill in their profession and have had experience in the management and treatment of the insane, and may not engage in outside practice. They employ and may discharge for cause nurses, attendants, and other necessary persons.

The St. Louis city sanitarium for the insane is under municipal control and management.

2. **Care.**—(a) *In State Institutions.*—State Hospital No. 1, Fulton; established 1850; 1250 beds.

State Hospital No. 2, St. Joseph; established 1874; 1550 beds.

State Hospital No. 3, Nevada; established 1887; 1209 beds.

State Hospital No. 4, Farmington; established 1903; 626 beds.

(b) *In Local Institutions.*—The city of St. Louis provides a small institution for the care of its insane, while a few mildly insane patients are cared for at the St. Louis city infirmary. The Marion County Hospital and the St. Charles County Asylum receive insane patients.

Insane persons who cannot be cared for in the state hospitals may be received in the county almshouses which are under management of the county courts.

3. **Commitment.**—(a) *Persons Committed.*—Persons afflicted with any form of insanity must be admitted to the state hospitals for the insane.

(b) *Legal Procedure in Commitment.*—When a citizen residing in

the proper county files with the clerk of the county court a statement, in writing and in prescribed form, alleging that a person is insane and in need of hospital treatment, the clerk must issue subpoenas for the persons named as witnesses, and such other persons as he may think proper, to appear before the county court at a specified time, which must be the first day of the first session of the court thereafter. The county clerk must convene the county court forthwith for the purpose of passing upon the sanity or insanity of the poor person apprehended. At the hearing the court must have the witnesses examined before themselves, or a jury, if one be ordered for the purpose. At least one of the witnesses examined must be a reputable physician. If the court, or the jury, is satisfied of the truth of the facts of the statement, it must enter an order to the effect that the person found insane is a fit subject to be sent to the state hospital, and require the medical witness to make out a detailed history of the case in the prescribed form. The clerk of the court must send a certified copy of the order of court to the superintendent of the hospital, accompanied by a request for the admission to the hospital of the person found to be insane. The superintendent must immediately advise the clerk whether the patient can be received, and at what time.

A pay patient, or one not sent to a hospital by order of the court, may be admitted on request to the superintendent in a prescribed form made by the person by whose direction he is sent, stating his age and place of nativity, if known, place of residence, occupation and degree of relationship to the person requesting his admission. Accompanying the request must be a sworn certificate of insanity in prescribed form, dated within two months, by two physicians. Before a private patient is admitted, thirty days' charges must be paid in advance and a bond with securities to insure payment of further charges must be given.

Indigent patients must always be given preference over pay patients.

If there are not sufficient accommodations, cases of less than one year's standing have preference over those of longer standing; but no county may have more than its just proportion according to its insane population.

(c) *Voluntary Admission*.—(See 3 (b) Pay patients.)

(d) *Appeal from Commitment*.—Any person restrained of his liberty may prosecute a writ of habeas corpus to inquire into the cause of his confinement or restraint; and any court empowered to grant the writ must do so without delay.

(e) *Cost of Commitment*.—The cost of examining patients and removing them to a hospital is a charge upon the treasury of the county of their residence.

4. *Conveying Patients to the Hospital*.—The sheriff of the county, or any other suitable person, must be directed by the clerk of the county court to convey the insane person to the hospital. The relatives of the insane person have the right, if they choose, to convey him. Before sending patients to the hospital the county court must see to

it that they are free from contagious disease, properly cared for, and clothed.

**5. Transfer of Patients. 6. Parole and Discharge of Patients.—**

The superintendent may parole a patient whenever he deems it best for the patient. The superintendent may discharge any patient who, in his opinion, has been fully restored to reason. (See 3 (d) Habeas corpus.)

**7. Cost of Maintenance.—**The counties sending insane poor to the hospitals must pay semi-annually in cash and in advance for their support and maintenance, and, in addition, the actual cost of their clothing, and if they die, the cost of burial expenses. Moneys paid and unexpended are refunded the counties.

If the county court so orders, the clerk must transmit to the superintendent a certificate stating that any patient in the hospital has not estate sufficient to support him there. Whereupon, the person becomes a county patient, to be supported by his county.

If the county court so orders, the clerk must transmit to the superintendent a certificate stating that any patient in the hospital from his county has sufficient estate to support him at the hospital. Thereupon the patient becomes a pay patient, and the charges must be made out and paid, and a bond required and executed as in all other cases of pay patients; and upon a failure thereof, after reasonable delay, the superintendent must discharge such patient.

If any insane person admitted to a state hospital as a patient has estate, the guardian must pay for his support and expenses out of the estate. If the insane person at any time comes under the class of "insane poor persons" he must be supported and maintained by his county.

**8. Criminal Insane.—**When a person indicted for any crime after his indictment and before his trial becomes insane, the court must order a jury to try and decide the question of his insanity. The alleged insane person must be notified of such proceedings, unless the court order such person to be brought before it. If the jury is satisfied that the person has become insane, they shall so declare in their verdict, and the court must order him to be conveyed to the state hospital and there kept until restored to reason.

When a person, tried upon indictment for any crime or misdemeanor, is acquitted on the sole ground that he was insane at the time of the commission of the offense, the fact must be found by the jury in their verdict, and the jury must further find whether or not he has entirely recovered from his insanity; if recovered, he shall be discharged from custody. In case the jury finds that the prisoner has not entirely recovered and is not a poor person, and the court is satisfied that it would be unsafe to permit him to go at large, the court must commit him to the hospital, the costs of commitment and all expenses for the support and maintenance of such prisoner to be paid out of the proceeds of his estate. If the prisoner is a poor person, the court must remand him to the custody of the sheriff or other officer of the court,



at the expense of the proper county, until the county court causes him to be removed to the hospital, as in the cases of insane poor persons, but without examination into his insanity.

## MONTANA

### Authorities:

Revised Codes of Montana, 1907

Laws of Montana, 1913

**1. Administration and Supervision.**—(a) *General.*—The state board of commissioners for the insane, consisting of the governor, the secretary of state, and the attorney general, is charged with the care, custody, maintenance, and treatment of the insane in safe and suitable buildings at the state hospital. The board makes its own rules and regulations, and prescribes the duties of the superintendent of the state hospital; it must inquire into the conditions at the hospital and see that the inmates are properly cared for. The record of the board's proceedings must be open at all times to the inspection of any citizen. The board also has authority to send insane persons to friends outside of the state at public expense or to the institution of another state, provided they are indigent, instead of to the state hospital. The board reports biennially to the legislature.

(b) *Institutional.*—There is no local board of trustees. The governor appoints with the approval of the senate a superintendent (salary \$4000) and assistant superintendent (salary \$3000) for the state hospital for the insane; they must be regularly licensed physicians of the state. Their tenure of office is four years and until their successors have been appointed; they may be removed by the state board of commissioners upon formal charges in writing. The superintendent has immediate control of the state hospital subject to the regulations of the board of commissioners and appoints additional medical assistants subject to the approval of that board.

**2. Care.**—(a) *In State Institutions.*—Montana State Hospital for the Insane, Warm Springs; established 1877; 1000 beds.

(b) *In Local Institutions.*—Harmless indigent insane and persons who cannot be received at the state hospital may be provided for at the poor farms, which are under the boards of county commissioners, or they may be cared for elsewhere under contract.

**3. Commitment.**—(a) *Persons Committed.*—All residents of the state, not idiots, are entitled to admission to the state hospital. Non-residents who have become insane while within the state are also admitted.

(b) *Legal Procedure in Commitment.*—Whenever it appears to the satisfaction of the magistrate of the county that any person within the county is so far disordered in his mind as to endanger health, person, or property, he must have the person arrested and taken before any district judge in the county for examination, or, in his absence, before the chairman of the board of county commissioners. The judge or chairman of the board must issue subpoenas to two or more witnesses

best acquainted with the insane person and at least two graduates of medicine, to attend and testify at the examination.

If the physicians believe the person to be dangerously insane, they must make a certificate to this effect, describe the symptoms, etc., and give other facts, in a form prescribed by the board of commissioners for the insane. If the judge, or the chairman of the board of county commissioners, after such examination and certificate are made, believes the person to be dangerously insane, he must order him to be confined in the state hospital, and a copy of such order must be filed with and recorded by the clerk of the district court of the county.

When an insane person is examined and committed by hearing before the chairman of the board of county commissioners, the latter must reduce all the evidence to writing, and the same, together with all orders, subpoenas, complaints, warrants and papers in the case, must be filed in the office of the clerk of the district court of the proper county. In all cases of hearings by the chairman of the board of county commissioners, the proceedings must be examined and certified, and approved or rejected by the judge of the district court.

(c) *Voluntary Admission.*

(d) *Appeal from Commitment.*—Every person restrained of his liberty may prosecute a writ of habeas corpus and upon petition the circuit or district court must grant it.

(e) *Cost of Commitment.*—The costs of the examination, committal and taking of an insane person to the hospital must be paid by the county in which he resides at the time he is adjudged insane. The sheriff is allowed the actual expense incurred in taking an insane person to the hospital.

**4. Conveying Patients to the Hospital.**—The insane person, together with the order of the judge or chairman of the board of county commissioners, and the certificate of the physicians must be delivered to the sheriff of the county and by him to the officer in charge of the state hospital.

**5. Transfer of Patients. 6. Parole and Discharge of Patients.**—Upon the written report of any person appointed by the board of commissioners of the insane to examine into the condition of a patient, that he is in fit condition to be at large, the board must cause him to be discharged from the hospital. Every insane person on recovery, must be discharged from the hospital or place of confinement. Indigent patients when discharged must be provided with \$20 in money and comfortable clothing. (See 3 (d) Appeal from commitment; habeas corpus.)

**7. Cost of Maintenance.**—The care and maintenance of non-indigent insane must be paid or guaranteed by their parents, children, or guardians.

When a person is adjudged to be insane and ordered confined in the state hospital, the judge or person before whom the hearing is must take evidence as to the financial worth of the insane person. If he has any means out of which the expenses of his maintenance in

the state hospital, or any part thereof, can be paid, the judge or person before whom the hearing is had must cite the persons in possession of his property, and his relatives, if there are any in the county of his residence, to appear and show cause why a guardian should not be appointed for him and ordered to pay the costs of his maintenance, or as much of it as his means will permit. If the insane person has property that can be applied toward his maintenance, the court must make an order to that effect, stating how much of it shall be applied.

Indigent insane are maintained at the hospital at the cost of the state.

**8. Criminal Insane.**—If a doubt arises as to the sanity of the defendant in a criminal action, the court must order the question as to his sanity submitted to a jury. If the jury finds the defendant insane the trial or judgment must be suspended until he becomes sane, and the court must order that he in the meantime be committed by the sheriff to the state hospital for the insane, and that upon his becoming sane, he be re-delivered to the sheriff.

The expenses of sending the defendant to the hospital, keeping him there, and of bringing him back are chargeable upon the county in which the indictment was found, or the information filed; but the county may recover from the estate of the defendant, or from a relative of the town, city, or county bound to provide for and maintain him elsewhere.

Insane convicts must be received into the hospital on the order of the board of state prison commissioners, and returned to the state prison upon recovery if sentence has not expired.

## NEBRASKA

### Authorities:

Revised Statutes of Nebraska, 1913  
Laws of 1915, 1917

**1. Administration and Supervision.**—(a) *General.*—The state board of charities and corrections is composed of the governor, the superintendent of public instruction and the commissioner of public lands and buildings. The board has the duty to inquire into the whole system of public charities in the state and counties and to ascertain the condition of all institutions. The governor may at any time in his discretion order a special investigation to be made by the state board or by a committee of its members, or advisory secretaries, into the management of a state hospital or county institution in the state. A report of such investigation must be submitted by the governor to the legislature. The board must make a full report of its proceedings biennially to the governor.

The board of commissioners of state institutions consists of three members appointed and removed by the governor with the consent of the senate. The members receive \$3000 per annum and necessary expenses, and hold office six years; no two may be appointed from



the same congressional district and no more than two may belong to the same political party.

Each institution must be inspected thoroughly by the whole board every six months and by some member every thirty days.

The board has general control and management of all state charitable, penal, and correctional institutions, including the hospitals for the insane, with authority to make all necessary rules for their government, including regulations with regard to the classes of patients to be admitted to each, their transfer, etc.

The board appoints a superintendent, assistants, and steward for each state hospital, and a matron for the Nebraska State Hospital. All appointments remain effective until revoked by the board.

(b) *Institutional*.—There are no local boards of trustees.

2. **Care**.—(a) *In State Institutions*.—Nebraska Hospital for the Insane, Lincoln; established 1870; 700 beds.

Norfolk State Hospital, Norfolk; established 1887; 450 beds.

Nebraska State Hospital, Ingleside; established 1889; 1300 beds.

(b) *In Local Institutions*.—In case a person found insane cannot be at once admitted to the hospital for lack of room or other cause, the county commissioners of insanity direct the commissioners of the county or overseers of the poor to care for him in the poorhouse, or if there be none and no more suitable place can be found, in the jail. Lists of such deferred cases are kept and reported to the state board.

3. **Commitment**.—(a) *Persons Committed*.—Insane persons, except idiots, whether they have a legal residence in the state or not, are admitted to the hospitals. Dipsomaniacs, inebriates, and persons addicted to drugs are admitted to and treated in the Nebraska Hospital for the Insane at Lincoln.

(b) *Legal Procedure in Commitment*.—In each organized county of the state there must be three commissioners in insanity, and the clerk of the district court is one of them, ex-officio. The other members are appointed for terms of two years by the judge of the district court, and one must be a respectable practising physician, and the other a respectable practising lawyer. In the temporary absence or inability to act of two of the commissioners, the judge of the district court, if present, may act in the place of one of such commissioners, or the commissioner present may call to his aid a respectable practising physician or lawyer. The clerk of the board must issue all notices of the appointments, warrants, subpoenas, etc. He must keep separate books of the proceedings of the board, to constitute, with the papers filed, a complete record of their findings, orders, and transactions. The commissioners have cognizance of all applications for admission to the hospital or for the safe-keeping of insane persons within their respective counties, except in cases otherwise provided for. They have power to issue subpoenas, administer oaths, and do any act of court necessary in the premises.

Application for admission to a hospital must be made to the county commission of insanity in writing, verified by affidavit, alleging that

the person applied for is believed to be insane and a fit subject for custody and treatment in a hospital, that he is found in the county and has a legal settlement therein, or, if not, where it is believed to be. The commissioners must at once take steps to investigate the grounds of the information. They may require the alleged insane person to be brought before them, and the examination had in his presence, providing for his custody until their investigation is concluded. They may dispense with his presence if it would probably be injurious to him or attended with no advantages. They must hear testimony for and against the application.

Any citizen of the county or any relative of the person may resist the application, and employ counsel if they choose. The commissioners must in all cases appoint some regular practising physician of the county to make a personal examination of the person alleged to be insane. The physician may or may not be of their own number, and the one appointed must certify whether he finds the person in question insane or not. He must endeavor to obtain from the relatives of the person in question, or from others who know the facts, correct answers so far as may be to the interrogatories prescribed by law, which with the answers to them must be attached to his certificate. The commissioners thereupon must find whether the person is insane, and whether if insane, a fit subject for treatment and custody in the hospital and where his legal settlement is. If they find him insane and a fit subject for custody and treatment in the hospital, they must issue their warrant authorizing the superintendent of the hospital to receive him as a patient.

If a patient cannot at once be admitted for want of room or for any other cause, and cannot with safety be allowed to go at liberty, the commissioners must provide suitably for him, until admission can be had or the occasion for it no longer exists. Such patients may be cared for either as public or as private patients, those being treated as private patients whose relations or friends will obligate themselves to provide for them without public charge, in which case the commissioners must appoint some suitable person as special custodian, with authority to restrain, protect, and care for such patient. In the case of public patients, the commissioners must require that they be properly cared for by the commissioners of the county or overseers of the poor at the expense of the county. If there is no poorhouse, or no more suitable place, they may be confined in the jail of the county in charge of the sheriff.

On application to the commissioners on behalf of persons alleged to be insane and whose admission to the hospital is not sought, the commissioners may provide for them as in the case of other applicants.

If the commissioners of any county are informed that any insane person is suffering for want of proper care, they must make all needed provisions for him as provided in other cases.

Insane persons who have been under care, either as private or public patients, outside of a hospital, by authority of the commis-

sioners of any county may on application be transferred to a hospital on the warrant of the commissioners. The admission may be had without another inquest, at any time within six months after the inquest already had.

If it becomes necessary for want of room or other cause to discriminate in the reception of patients, a selection must be made as follows: (1) recent cases (cases of less than one year's duration); (2) chronic cases (of more than one year's duration) presenting the most favorable prospects of recovery; (3) those for whom application has been longest on file, other things being equal, and (4) when cases are equally meritorious in all other respects, the indigent insane have preference.

(c) *Voluntary Admission.*

(d) *Appeal from Commitment.*—On a sworn statement to a judge of the district court of the county in which a hospital is situated, or of the county in which any certain person confined in a hospital has his legal settlement, alleging that such person is not insane, the judge must appoint a commission of inquiry of not more than three persons, one of whom must be a physician, and if two or more are appointed, one must be a lawyer. Their report must be accompanied with a statement of the case by the superintendent. If the judge finds the person not insane, he must order his discharge; if not, he must authorize his continued detention. The commissioners are entitled to their necessary expenses and a reasonable compensation, to be paid by the applicant if the application was made without probable grounds. A commission may not be repeated oftener than once in six months in regard to the same person, nor may such a commission be appointed in the case of any patient within six months of the time of his admission.

All persons confined as insane are entitled to the writ of habeas corpus, and the question must be decided at a hearing; an adverse decision does not bar the issuing of the writ a second time or whenever it is alleged that the person has been restored to reason. If at such a hearing it appears that the patient was irregularly committed but is not restored to reason, he may be returned to the county from which he was committed to be proceeded with according to law.

(e) *Cost of Commitment.*—The expenses connected with the commitment and transportation of a patient to the hospital are to be paid by the county in which he has a legal settlement. If he has no settlement they are borne by the state.

**4. Conveying Patients to the Hospital.**—The sheriff must convey the insane person to the hospital; or, in his absence, the commissioners of insanity may appoint some other suitable person. No female may be taken to the hospital without the attendance of some other female or some relative of such person. The superintendent in his acknowledgment of delivery must state whether there was any such person in attendance. If any relative or immediate friend of the patient who is suitable request it, he has the privilege of executing the warrant in preference to the sheriff or any other person.



**5. Transfer of Patients.**—This is within the exclusive jurisdiction of the board of commissioners of state institutions.

**6. Parole and Discharge of Patients.**—Any patient who is cured must immediately be discharged by the superintendent and furnished with suitable clothing and a necessary sum of money. The relatives of any patient not susceptible of cure and harmless have the right to remove him on the consent of the board of commissioners.

On the application of the relations or immediate friends of any patient, except one under charge or conviction of homicide, who is not cured, and who cannot safely be allowed at liberty, the commissioners of insanity of the county where he belongs, on making provisions for his care within the county, may authorize his discharge. Incurable and harmless patients must be discharged or removed whenever it is necessary to make room for recent cases. When it is shown to the satisfaction of the commissioners of insanity of any county that cause no longer exists for the care within the county of any particular person as an insane patient, they must order his immediate discharge.

**7. Cost of Maintenance.**—The cost of board, care, and treatment of patients while in the hospitals of the state is borne by the state, unless some legally liable relative has sufficient means to do so. The commissioners of the several counties are authorized, however, to collect from the property of such patients, or from any person or persons legally bound for their support, any sum paid by the county in their behalf.

The relatives or friends of any patient in a hospital for the insane have the privilege of paying any portion or all of his expenses. If the husband or parent is possessed of an estate or income sufficient to meet the expense, they are required to pay an amount equal to the cost of maintenance.

**8. Criminal Insane.**—If a person charged with crime becomes insane after the offense, a jury must be impaneled to determine the question of insanity.

The physician of the state penitentiary, the superintendent of one of the hospitals for the insane, and a secretary of the state board of health constitute the penitentiary medical board. When the physician of the penitentiary believes that a convict is insane, he must so certify to the governor, who shall immediately cause an examination to be made by the penitentiary medical board, and upon its certificate, the governor may direct the convict to be removed to one of the hospitals for the insane. When the superintendent is satisfied that a convict in his custody is restored to sanity, he must so certify to the governor of the state, who must order the convict to be returned to the penitentiary to serve the unexpired term of his sentence, less the time of his confinement in the hospital.

## NEVADA

## Authorities:

Compiled Laws of Nevada, 1912  
Laws of 1913, 1915

**1. Administration and Supervision.**—(a) *General.*—The board of commissioners for care of indigent insane, consisting of the governor, state treasurer, and state comptroller, has full power and exclusive control of the state hospital for the insane and its inmates, of the appointment and removal of a superintendent, and of establishing the regulations and by-laws for its government. A record of their proceedings must at all times be open to inspection by a committee of the legislature, and they are required to make a biennial report in detail to the legislature of all that pertains to the activities of the hospital.

(b) *Institutional.*—There is no local board of trustees. The superintendent must be a graduate in medicine; his salary is \$2400 a year; and he is empowered to employ all necessary help needed at the hospital, subject to the approval of the board of commissioners, to which he is required to make a monthly report of the operations of the institution.

**2. Care.**—(a) *In State Institutions.*—Nevada Hospital for Mental Diseases, Reno; established 1882; 300 beds.

(b) *In Local Institutions.*—There is no provision for the local care of insane in almshouses or other local institutions.

**3. Commitment.**—(a) *Persons Committed.*—All insane residents of the state are entitled to admission to the state hospital. Idiots and feeble-minded persons may be admitted if it is found to be for the best interests of the county of which they are residents.

(b) *Legal Procedure in Commitment.*—The judge of the district court in each judicial district in the state, or in his absence the county clerk, upon the sworn application that any person by reason of insanity is unsafe to be at large because of his homicidal, suicidal, or incendiary disposition, which must not be the result of delirium tremens, harmless imbecility, or feeble-mindedness, either congenital or as the result of alcohol, drugs, or the natural failing of old age, must cause such person to be brought before him, and cite one or more licensed practising physicians to examine the person alleged to be insane. If the physicians certify upon oath that the charge is correct, and if the judge is satisfied that the person is by reason of insanity, unsafe to be at large, incompetent to provide for his proper care and support, has no property applicable for such purpose, and has no husband or wife, father or mother, children, brother or sister living within the state of sufficient ability to provide care and support, he must commit him to the hospital, and transmit to the superintendent a copy of the complaint, commitment, and physicians' certificate, together with a transcript of the court examination, which must be in the form prescribed by the board of commissioners.

(c) *Voluntary Admission.*

(d) *Appeal from Commitment.*—Any person restrained of his liberty

may prosecute a writ of habeas corpus to inquire into the cause of it. A writ may be granted by any judge of the supreme or district courts.

(e) *Cost of Commitment.*—The district judge must inquire into the ability of insane persons committed by him to bear the expenses attending commitment to the hospital. If the insane person has means, the district judge must appoint a guardian, who shall pay all proper costs and charges incidental to commitment. If the person is unable to pay the costs of commitment, the judge may assess them among such of the patient's kindred residing in the state as he may deem just and equitable; otherwise, the expense of committing indigent insane persons from the various counties of the state to the hospital constitutes a charge upon the state.

4. **Conveying Patients to the Hospital.**—The person committed must be delivered, together with the warrants of the judge, certificates of the physician, and a transcript of the court proceedings, to the sheriff of the county. The sheriff notifies the superintendent of the state hospital, who designates a hospital employee to transport the insane person to the hospital, to which employee the sheriff must deliver the patient.

Any relative of the first degree has the right, however, to act as attendant at his own expense, and no female may be conveyed to the hospital without at least one female attendant or a relative in the first degree.

The expense of sending patients to the hospital must be paid by the guardian if the patient has means; if the patient is indigent, the cost may be assessed among near relatives residing in the state; otherwise, the cost of conveyance is paid by the state.

5. **Transfer of Patients.** 6. **Parole and Discharge of Patients.**—All patients committed to the state hospital are considered to be on probation for the first thirty days. At the end of the probationary period the superintendent may, if he deems it desirable, notify the board of commissioners, asking it to authorize him to request the district judge of the county in which the hospital is located to appoint a commission of three competent physicians to examine the patient. If the commission determines that the patient is not unsafe to be at large by reason of his insanity, although unsafe at large because of feeble-mindedness, illness, or bodily infirmities, the superintendent must notify the commissioners of the county from which the patient was committed, and the commissioners must take the patient back to the county at the county's expense. Should the commissioners agree to pay the state the actual expense of maintaining the patient at the state hospital, the patient may be kept at the state hospital at the expense of the county.

7. **Cost of Maintenance.**—Indigent insane persons are cared for at the hospital at the expense of the state. In the case of a patient of means, a guardian is appointed who must pay for his care and support during the period of his insanity, or so long as there is sufficient means to meet the expenses. If such insane person has no means applicable to his support, but has kindred in the degree of husband



or wife, or (if a minor) father or mother living within the state, of sufficient means, the judge before whom the examination is had must order all expenses and charges paid by the nearest of such kindred, or may assess them among the kindred as he may deem equitable.

**8. Criminal Insane.**—When a defendant in a criminal case appears to be insane, the question must be submitted to the regular or to a special jury. An acquittal on the ground of insanity must be followed by an order of the court committing the person to the hospital for mental diseases.

When a convict undergoing imprisonment in the Nevada state prison becomes insane and is so adjudged by a commission of lunacy appointed by the court as in other cases of insanity, the warden must deliver him to the superintendent of the state hospital for detention and treatment. If the convict is restored to sanity before the expiration of his sentence, he must be returned to the warden of the state prison to serve the unexpired term of his sentence, unless he is released by order of the board of pardons.

## NEW HAMPSHIRE

### Authorities:

Public Statutes of New Hampshire, 1901

Supplement to Public Statutes of New Hampshire, 1901-1913

Laws of New Hampshire, 1915, 1917

**1. Administration and Supervision.**—(a) *General.*—The state board of health, which is composed of the governor, the attorney general, three physicians and a civil engineer, constitute a commission of lunacy. The physicians and engineer are appointed by the governor for terms of four years.

The commission is charged with the duty of visiting and inspecting all hospitals and other institutions for insane persons at least once in four months, and to examine into all matters relating to the care and general welfare of the inmates. It may order the removal of any indigent insane person to the state hospital.

The commission must keep a correct record of the number of commitments, discharges, and deaths at each hospital, institution, or other place of detention, giving details as to age, sex, and nationality, and report the same annually to the governor and the council. The superintendent of every hospital or other place where insane are confined must within three days after the commitment of any person notify the commission of lunacy of the fact.

Any person or corporation desiring to maintain a sanitarium or hospital for the reception of persons of unsound mind or for the treatment of specific diseases must first make application to the state board of health. After investigation the board may issue a license to the applicant with such restrictions as are deemed necessary. The hospital or sanitarium must be open to inspection by the board of health at all times. Any person violating the above provisions may be fined not more than \$500 or imprisoned for not more than one year, or both.

The board of charities and corrections is composed of five persons appointed by the governor and the council for five years. The members receive no compensation except expenses incurred. The secretary of the state board of health is ex-officio a member of the board of charities. The board has the duty of inspecting all state and county charitable and correctional institutions. The board must report biennially to the governor and may make recommendations to the county commissioners.

The board of trustees of state institutions consists of the governor and five persons who are appointed by him with the consent of the council for terms of five years. The members receive eight dollars a day and expenses for each day they are engaged in their official duties. The board has control of five institutions including the hospital for the insane. All the powers and duties heretofore imposed and conferred upon the boards of trustees of each of these institutions are now imposed upon the new board of trustees. The board must hold a regular meeting at least once each week, and at such other times as its duties require, for the purpose of hearing such matters as the superintendents of the institutions may desire to bring to its attention. Each institution must be visited and inspected by a member of the board at least once each month and the board must make rules for such visits by its members in rotation and such other rules as may be deemed proper. The board must employ a competent person to act as purchasing agent for all state departments and institutions; his annual salary must not exceed \$3000.

(b) *Institutional*.—There is no local board of trustees of the state hospital for the insane. The superintendent is appointed by the board of trustees of state institutions.

2. **Care**.—(a) *In State Institutions*.—New Hampshire State Hospital, Concord; established 1843; 1250 beds.

(b) *In Local Institutions*.—There are no local public institutions for the insane.

3. **Commitment**.—(a) *Persons Committed*.—All insane persons, residents of the state are entitled to admission to the state hospital. The term insane includes every idiot, non compos, lunatic, insane, or distracted person.

(b) *Legal Procedure in Commitment*.—The parent, guardian, or friends of any insane person may cause him to be committed to the state hospital with the consent of the trustees. Any insane pauper supported by a town may be committed to the hospital by order of the overseers of the poor and supported at the expense of the town. In case the overseers neglect to make such order in regard to any insane county pauper, the supreme court or any judge thereof may order him to be committed to the hospital and supported at the expense of the county. If an insane person is in such condition as to be considered dangerous while at large, a judge of probate upon petition by any person and notice to the selectmen of the town, may commit him to the hospital. No person may be committed to the state hospital,

except by an order of the court or the judge of probate, without the certificate of two reliable physicians, given after a personal examination made within one week of the committal.

When application is made to the judge of probate or of the supreme court for the committal of any person to the state hospital, the court may appoint two reputable physicians to examine said person, with or without notice to him from the court. The physicians must immediately report the result to the court, who may upon their report order the person to be committed to the state hospital when there is a sufficient reason for so doing. The certificate of the physicians must be accompanied by a certificate of the judge of the supreme court or court of probate, mayor, or one of the selectmen.

(c) *Voluntary Admission.*—The superintendent of the hospital may receive and detain any person who applies to submit himself for treatment. Notice of admission must be given to the board of lunacy. The patient may not be detained more than seven days after notice of intention to leave is given. The charges for support are governed by the law relating to insane persons.

(d) *Appeal from Commitment.*—The supreme court, or any justice thereof, at any time, with or without notice, when proper application is made, must investigate the question whether there is sufficient reason for the detention of any person who has been committed to the hospital, and must order his discharge if it ought to be made.

(e) *Cost of Commitment.*

**4. Conveying Patients to the Hospital. 5. Transfer of Patients.**—The state board of commissioners of lunacy is empowered to transfer any indigent insane person to the state hospital, to be supported by the state, provided satisfactory affidavits are executed by the county selectmen, or the board of commissioners, or both, and the board may declare that in its judgment the patient or any patient chargeable is able to bear the expense incident to his maintenance at the hospital.

**6. Parole and Discharge of Patients.**—The superior court or any justice thereof may parole a person committed to the state hospital upon such terms and conditions as justice may require; and the court or justice may at any time revoke the parole and order the person returned under the original commitment.

The superintendent with the approval of the board of trustees of state institutions may grant parole for a period not exceeding six months.

Any person committed to the state hospital may be discharged by any three trustees, by the commission of lunacy, or by a justice of the supreme court, whenever further detention at the hospital, in their opinion, seems unnecessary; but a person so discharged, who was under sentence of imprisonment at the time he was committed, must be remanded to prison for the unexpired period of his sentence of imprisonment. Provision is made for inmates of the hospital to make statements in private to a trustee, and whenever a trustee deems it proper he must call to his aid two other trustees who after further



examination of the inmate and statements made by him are in duty bound to discharge him if, in their judgment, further detention is unnecessary.

**7. Cost of Maintenance.**—An insane person committed to the hospital, who has no means of support, no relatives of sufficient ability who are chargeable with his support, and no settlement in any town in the state, and whose condition is such that his discharge from the hospital would be unsafe, must be supported by the county from which he was committed. An insane person chargeable with an offense under penalty of death or confinement in the state prison, and who is committed to the hospital by order of the supreme court, must be supported at the expense of the state during his confinement. Any other insane person committed to the hospital by the supreme court, judge, or sheriff, and any insane person committed by a judge of probate must be supported by the county from which he was committed.

The county or town paying the expenses for the support of an inmate is entitled to recover the amount paid of the inmate himself if of sufficient ability to pay; otherwise of the town, county, or person by law liable for his support.

An insane person who has been an inmate of the state hospital for twenty years, and been supported in whole or in part during that time by others from the town or county chargeable therewith, and who has no means of support, and no relatives chargeable for it, and who cannot properly be discharged from the hospital, must be supported there at the expense of the state.

Indigent insane persons at the state hospital for treatment may be maintained by the state upon orders issued to that effect by the state board of commissioners of lunacy. When a patient, or relatives chargeable with his support, is able to pay only a part of the expenses for maintaining the patient at the state hospital, the state board upon satisfactory evidence of the facts may direct that the part of the expense of maintenance which cannot be met by the patient or relatives, shall be paid by the state.

**8. Criminal Insane.**—When a person is indicted for any offense or committed to jail on any criminal charge to await the action of the grand jury, any justice of the court before whom he is tried may, or the plea of insanity, put such person into the care and custody of the superintendent of the state hospital, to be detained and observed by him until further order of the court. The person so committed must be supported there at his own expense if of sufficient means, otherwise at the expense of the state.

Whenever the grand jury omits to find indictment against a person because of insanity or a person prosecuted for an offense is acquitted by the petit jury, the jury must certify the fact to the court; when any person prosecuted for an offense pleads that he is not guilty by reason of insanity, the court may commit him to a prison or to the state hospital to remain until discharged by due course of law if, in the opinion of the court, it would be dangerous to allow him at large.

The governor and council, the supreme court, may discharge any such person from prison, or may transfer any prisoner who is insane to the state hospital to be kept there at the expense of the state, whenever they are satisfied that such discharge or transfer is necessary. Any prisoner may be temporarily transferred to the state hospital, for the purpose of observation, by the board of trustees of state institutions.

## NEW JERSEY

### Authorities:

Compiled Statutes of New Jersey, 1910

Laws of New Jersey, 1911, 1912, 1916, 1917

**1. Administration and Supervision.**—(a) *General.*—A salaried commissioner of charities and corrections, appointed by the governor for a term of three years, has the duty of inspecting all charitable and correctional institutions receiving funds from the state. He has power to see all state wards, must see all such who are in private institutions, and may require reports from the institutions under his inspection, together with other information in the form he may prescribe. The commissioner must report annually to the governor.

The commissioner or some officer representing the department of charities and corrections must visit the hospitals twice a year or oftener and inquire into their facilities, equipment, sanitary conditions, accommodations, and manner of management.

All private institutions for the care of the insane must be licensed by the commissioner of charities and corrections upon plans approved by him after careful inquiry. All licensed private institutions for the insane must be inspected at least twice a year by the department of charities and corrections and reported upon to the governor. A private institution for the insane must have at least one properly qualified resident physician.

(b) *Institutional.*—Each state hospital for the insane is under the general control of a board of managers consisting of ten persons, two of whom must be women. Not more than four of the male members may belong to the same political party. They are appointed by the governor for terms of five years.

Each board is authorized and directed to establish the necessary by-laws in regard to the appointment of executive officers, assistants, attendants, and employees necessary for the management of the hospital, and fixes the conditions of admission, support, and discharge of patients. Each board appoints a medical director and as many assistants as may be deemed necessary, also a warden of the hospital, as general manager of the buildings, grounds, farms, etc., belonging to the hospital, whose duty it is, among other things, to make estimates of the amounts of money required for the support and maintenance of the hospital for the next ensuing fiscal year, and to submit such estimates to the board of managers. At least one manager must visit the hospital once in every week; two or more managers at least once in each month; a majority of the board at least once in three

months; and the whole board at least once a year. The board must make an annual report to the governor detailing the past year's operations, and the actual state of the hospital. Each board is authorized to appoint a secretary.

The county hospitals are under the control of the boards of chosen freeholders, who are authorized to appoint superintendents and other officers necessary, subject to removal by a vote of two-thirds of the members, to fix the compensation of officers, to establish rules for the management of the hospitals, and terms of admission, support, and discharge of patients.

2. **Care.**—(a) *In State Institutions.*—New Jersey State Hospital at Trenton, Trenton; established 1847; 1600 beds.

The New Jersey State Hospital at Morris Plains, Greystone Park; established 1874; 1750 beds.

(b) *In Local Institutions.*—There are nine county institutions, most of them designed as hospitals, which receive committed insane patients and derive support from the state at the rate of \$2 a week a patient. The Newark City Hospital has a psychopathic ward.

3. **Commitment.**—(a) *Persons Committed.*—The indigent insane without a legal settlement in any county are committed to the state hospitals. Indigent insane having a legal settlement in some county are committed to county institutions of the county of which they are legal residents or may be maintained by their counties at state hospitals. Idiots, imbeciles, and feeble-minded are not considered insane unless charged with commission of crime.

Pay patients may be received at the state hospitals when there are vacancies.

(b) *Legal Procedure in Commitment.*—No one may be committed to or confined in any institution for the care and treatment of the insane in the state except upon filing with the medical director of the institution an application in writing by the person interested in his admission. The application must be made on an approved form.

If the patient should be placed under immediate restraint a statement of his condition must appear in the certificate of the physician. The person making the application must obtain an order of temporary commitment from a judge of any court of record in the county in which the person resides. Justices of the peace are not considered judges of courts of record in places where a district court exists. If it is impossible to obtain an order of temporary commitment a statement to that effect in the application and certificates will warrant the patient's detention.

Orders of temporary commitment must contain proof of the patient's mental condition, and must be filed with the medical director of the institution to which commitment is made. The orders are valid for twenty days. The medical director must mail certified copies of the temporary commitment papers to the commissioner in lunacy of the county from which commitment is requested. The commissioner must apply to the court to fix a day for the final hearing, which



must not be more than twenty days from the date of the temporary order of commitment. The judge must serve notice upon the patient and others interested, may make inquiry and take proofs of insanity of the person so confined and in his discretion call a jury. The inquiry must be concluded within three months after the presentation of the application.

In all counties where the county counsel, county solicitor, county clerk, county physician, or county probation officer or any of their assistants is now in charge and supervision of the preparation of papers relating to the commitment of insane, such person shall be known as the commissioner in lunacy; in all other counties the judge of the court of common pleas, with the consent of the board of chosen freeholders, shall designate some county official as commissioner in lunacy. The commissioner shall have charge and supervision of the preparation of papers relating to the commitment of the insane. The board of chosen freeholders must notify the various institutions of the name and address of such commissioner.

If the justice or judge finds the person insane, he must so certify, and order him confined in one of the institutions for the care and treatment of the insane in the state until he has recovered, or is removed or discharged. The order is filed with the clerk of the county, who must forward a certified copy to the medical director of the institution in which the person is confined. If the justice or judge determines that the person is sane, he must order his discharge from the institution in which he is confined, and file the papers in the case as provided above.

A physician certifying to the insanity of any person for the purpose of securing his commitment as insane must be of reputable character, licensed to practise medicine, a permanent resident of the state, who has been in the actual practise of his profession for at least five years. No certificate of insanity may be made except after a personal examination of the person alleged to be insane held not more than ten days prior to his confinement, and according to forms approved by the commissioner of charities and corrections.

The medical certificates must contain a thorough description and identification of the person sought to be confined, and all required information on the approved forms. A non-resident of the state may, however, be confined on the certificates of two physicians having the qualifications required by the laws of the state from which the non-resident is sent, who are residents of the state from which the non-resident is sent; but a non-resident may not be held in confinement for more than fifteen days, except upon the certificates of two physicians resident in the state of New Jersey.

No physician may certify to the insanity of any person for the purpose of securing his confinement in any institution with which he is connected or interested in, or who is a near relative, by blood or marriage, or guardian or trustee of the person sought to be confined.

Application may be made by a person interested by reason of

relationship or marriage, by the person having charge or care of the patient, or by a sheriff, overseer of the poor, chief of police or police captain, warden, or other officer of any correctional or charitable institution in which the patient may be.

Every medical director of an institution for the insane must, within three days after the reception of a patient, have a descriptive entry recorded of his case, and from time to time other entries in regard to the mental state, bodily condition, and medical treatment of the patient, together with the forms of restraint employed. In the event of the discharge or death of the patient the medical director must record the circumstances.

In case of temporary commitment the director sends copies of the papers to the county commissioner in lunacy, who presents them to the judicial officer of the county.

If a person residing in the state is insane and indigent, it must be set forth in the application. The justice or judge to whom application is made must determine the question of his indigence as well as of his insanity.

If he finds that the person is insane but not indigent he must so certify, and order him confined in one of the institutions for the care and treatment of the insane, if proper arrangements have been made for his maintenance; and the judge must ascertain, if possible, the legal settlement of the person.

If the judge finds the person to be insane and indigent and to have a legal settlement in the county in which he resides, he must order him confined in the institution for the care and treatment of the insane owned by the county in which he has a legal settlement, otherwise in a state institution for the insane.

If the chief medical officer of any hospital for the insane has a doubt of the insanity of a patient admitted by him, he must certify it to the county commissioner in lunacy.

The proceedings in committing insane patients to private institutions are the same as those required for commitment to public institutions.

(c) *Voluntary Admission*.—Any resident of the state, believing himself about to become insane and desiring to submit himself to treatment, may be admitted to any state hospital for the insane upon application to the medical director. The application must give all the facts in the case, including a declaration as to the financial condition of the applicant. The county commissioner in lunacy is notified and determines the patient's financial condition. He is supported on the same terms as one committed.

A voluntary patient may be discharged upon the certificate of the medical director, because he is cured or because treatment in the institution is unnecessary or undesirable. A voluntary patient may leave the institution upon three days' notice to the medical director.

(d) *Appeal from Commitment*.—The patient or any friend or relative in his behalf may obtain a writ of habeas corpus.

(e) *Cost of commitment* is borne by the applicant or the county.

4. **Conveying Patients to the Hospital.**—When a female patient is to be taken to any institution she shall be accompanied by husband, brother, father, son, family physician, or suitable female attendant.

5. **Transfer of Patients.**—The judicial officer of the county has authority to order a transfer, the cost of which is borne by the institution from which the patient is transferred.

6. **Parole and Discharge of Patients.**—Any patient except one transferred from a penal or correctional institution may be paroled or discharged on the certificate of the medical director under regulations prescribed by the board of managers of the state hospital or freeholders of the county. Patients discharged must be furnished with suitable clothing and necessary traveling expenses, not exceeding \$10.

The board of managers may discharge an indigent non-resident patient to relatives living in another state or foreign country when it can be done without danger to him; or any non-indigent patient if those liable for his board are six months in arrears of payment. (See 3 (d) Appeal from Commitment; habeas corpus.)

7. **Cost of Maintenance.**—The state pays \$2.50 per week toward the cost of the support of indigent patients in the state hospital; and the county from which they were sent pays \$2 per week and furnishes clothing.

Indigent patients without a legal settlement in any county are supported by the state.

Every insane person in an institution for the insane is personally liable for his maintenance. The trustee, guardian, or relative bound by law to provide for him if he had not been sent to the institution is liable for the expenses of his clothing and maintenance. The parents, grandparents, the children, and grandchildren, husband or wife, if of sufficient ability, of every insane person in an institution for the insane whose estate is not sufficient for his support, are liable for his maintenance.

If, after commitment as indigent, a person is able to pay for his maintenance, or some other person is able to pay for it, or some other person is legally bound for his support, the county from which he was committed must collect the sums due for his maintenance. When it is found after the commitment of any person as a non-indigent patient that his estate is unable to pay for his maintenance, he becomes on judicial order an indigent patient, and his board and maintenance are a charge upon the county in which he has a legal settlement.

8. **Criminal Insane.**—When a person has escaped indictment, or been acquitted of a criminal charge upon trial on the ground of insanity, the court, if his insanity in any degree continues, must order him to be sent to the house of detention for criminal insane at the Trenton State Hospital or to a county asylum. In case he had legal residence in a county, that county bears its proportion of the expense of maintenance, otherwise the state bears it.

The proceedings in committing the criminal insane are the same as in other commitments. If the judge finds the person in question



insane he must so certify, and order him discharged from imprisonment and confined in one of the state institutions for the insane, or in a county institution for the insane, until he is restored to reason or removed or discharged. If the person is restored to reason during the pendency of the proceedings, he must be remanded to the place in which he was confined, but not unless the medical director of the institution in which he is confined, presents to the judge a certificate that he has been restored to reason.

In case a person confined in state prison appears insane, the same procedure is followed as in other cases of insanity. If the prisoner is found insane, the judge orders his commitment to the state hospital for the district in which he was convicted. If upon recovery his sentence has not expired, he must be returned to serve out the remainder of it.

## NEW MEXICO

### Authority:

New Mexico Statutes, 1915

1. **Administration and Supervision.**—(a) *General.*—The state is without a board having general supervision and control of the insane.

(b) *Institutional.*—The state hospital is under the management of a board of five unsalaried directors, appointed by the governor.

The directors are responsible for the buildings and property of the hospital, have the care and custody of all patients, and the disbursement of all moneys. The president of the board is the chief executive officer. He has general direction of the affairs of the hospital, nominates and with the advice and consent of the board of directors, employs all physicians, nurses, guards and other necessary employees, and fixes their salaries. The board enacts laws and regulations for the government of the hospital, its employees and inmates, and has power to remove any officer or employee of the asylum. The board has discretionary power in case of absolute necessity to remove patients to the nearest possible safe and appropriate place; to regulate the accounts; to examine and audit the expenditure for employees and all other expenses; to make regulations and fix the terms upon which insane patients who are not indigent or who are not residents of the territory may be admitted.

The medical superintendent must be a graduate in medicine and have practised his profession five years after the date of his diploma.

2. **Care.**—(a) *In State Institutions.*—New Mexico Insane Asylum, Las Vegas; established 1893; 250 beds.

(b) *In Local Institutions.*

3. **Commitment.**—(a) *Persons Committed.*—All insane residents of the state are entitled to admission to the state hospital. No case of idiocy, simple feeble-mindedness, delirium tremens, or mania from drinking may be received, and no person with a contagious or infectious disease. Non-resident indigent insane may not be admitted unless they became insane while within the state. Resident indigent insane have preference in admission.

(b) *Legal Procedure in Commitment.*—Whenever it appears, by affidavit, to the satisfaction of a judge of the peace of any county, that a person within the county is so far disordered in his mind as to endanger his health, person, or property, he must issue a warrant directing the person to be taken before any judge of the district court within the proper district for examination. The judge of the district court must subpoena two or more witnesses, best acquainted with said person, to appear and testify before him at the examination. A subpoena must also issue for at least one graduate of medicine, requiring him to attend the examination. If the physician certifies that the person is insane and that it would be dangerous for him to be at large in the community, and the court is satisfied of the same, he must order the person to be committed to the state hospital. If the person is indigent, the judge must so certify to the board of directors of the hospital.

(c) *Voluntary Admission.*

(d) *Appeal from Commitment.*—Every person restrained of his liberty may prosecute a writ of habeas corpus to obtain relief from the restraint, if it proves to be unlawful. Application for such writ must be made by petition to any judge of the supreme court, signed and verified either by the party for whose relief it is intended, or by some person in his behalf.

(e) *Cost of Commitment.*—The cost of examining and transporting an indigent insane person is chargeable upon the county from which he was taken.

4. **Conveying Patients to the Hospital.** 5. **Transfer of Patients.**  
6. **Parole and Discharge of Patients.**—Insane persons received into the asylum must be discharged upon recovery. (See 3. (d) Appeal from Commitment; habeas corpus.)

7. **Cost of Maintenance.**—When a person declared insane has property of any sort that can be subjected to the payment of his care and support at the hospital, the committing court must order proceedings to be taken accordingly.

8. **Criminal Insane.**—A person under indictment and found insane or who has been acquitted of a criminal charge on the ground of insanity, may be ordered by the court to be kept in strict custody in some place specified by the court while insanity continues.

Insane convicts must be received into the hospital and returned to the penitentiary upon their recovery unless their sentence has expired.

## NEW YORK

### Authorities:

Consolidated Laws of New York, 1910  
Criminal Code of New York, 1909  
Laws of New York, 1911, 1912, 1914, 1917

1. **Administration and Supervision.**—(a) *General.*—The state hospital commission consists of three members. One of the commissioners must be a reputable physician of at least ten years' experience in actual

practice and five years' experience in the care and treatment of the insane in an institution for this class; one must be a reputable attorney of not less than ten years' standing, and the third a reputable citizen. The commission chooses one of its members as chairman. All three commissioners are salaried officials, the medical commissioner receiving \$7500 per annum, and the other two \$5000 each. They are appointed by the governor, the medical commissioner to hold office during good behavior, and the other two commissioners for a term of six years. Any commissioner may be removed by the governor for cause. Attached to the office of the commission is a medical inspector, who is charged with the inspection of the state hospitals and especially with the examination of the patients confined in the different hospitals, and who must have at least five years' actual experience in an institution for the treatment of the insane.

The commission is, in general, charged with the execution of the laws relating to the custody, care, and treatment of the insane, but not laws relating to feeble-minded persons, epileptics, and idiots. It is required to examine all institutions, public and private, authorized to receive and care for the insane, and the methods of government and management of the inmates. The commission has the general oversight and the control of all the property of state hospitals for the insane, and accepts and holds any grant or bequest of money or property for the maintenance of any insane person in a state hospital or for other legitimate purpose. The commission must visit every state hospital and every private institution at least twice a year and make necessary recommendations. The matters that the commission must examine and inquire into are specified in detail. The commission is required to meet the board of managers of each hospital at least once a year for the consideration of the management and improvement of the institution. Any member of the commission or the medical inspector may visit any institution where any sick or infirm persons are received or treated for the purpose of ascertaining whether insane persons are confined there without authority. Persons in charge of such institutions must afford the commission free access and all needed information. The commission makes regulations in regard to correspondence of the insane in custody, and must approve books of record or blank forms for the official use of the hospitals. The commission is required to submit an annual report to the legislature, including financial estimates for the hospitals.

The hospital commission divides the state into as many hospital districts as there are state hospitals, and has power to change their limits. The hospital districts must be so defined that the number of patients in each is in proportion, as nearly as practicable, to the hospital accommodations provided within it.

Physicians having obtained certificates as medical examiners in lunacy must file the certificate with the clerk of their county and send a certified copy to the hospital commission within ten days. The commission must keep a record of all medical examiners, and the latter



are not qualified until they have received from the commission an acknowledgment of the receipt and filing of their certificates.

The form of the record of patients to be kept by the commission is prescribed in detail by the law, and all institutions are required to furnish the information called for by the record within a specified time, as well as information in regard to other necessary matters.

The commission is especially charged to provide for the prospective wants of the poor and indigent insane and for the prevention of overcrowding. It must furnish the legislature each year an estimate of the probable number of patients becoming inmates of the respective state hospitals during the ensuing year, and the cost of additional buildings and equipment when such are necessary. No expenditures may be made for additional buildings or extraordinary equipment except upon plans and specifications approved by the commission and the governor.

The commission must establish a bureau of deportation for the examination of insane, idiotic, imbecile, and epileptic immigrants, and alien and non-resident insane, consisting of a medical examiner, and such medical or lay deputies as may be necessary, the appointments being made by the commission. The medical examiner of the bureau must be a reputable physician of at least ten years' active experience in his profession and of at least five years' experience in the care and treatment of insane in the hospitals of the state or elsewhere. He receives a salary of \$5000 a year, holds office during good behavior, and is removable by the commission for cause. The commission must endeavor to arrange for the continued official recognition of the bureau by the proper authorities of the United States or other states in carrying out its purposes. The bureau must maintain a careful inspection of the methods and facilities for examining the immigrants with mental diseases at the port of New York, and is required to report to the commission from time to time in regard to methods employed, the prevalence of insanity among the immigrants and the foreign-born population, and to make recommendations in regard to the means by which insane, idiots, imbeciles, and epileptics may be deported. It must examine alien and non-resident insane persons in the state hospitals, in other public institutions, and elsewhere in order to determine whether they are suitable cases for deportation under the immigration law or are removable to other places or states. The superintendents of hospitals and institutions must notify the bureau of all such cases coming under their jurisdiction and furnish the necessary information. The bureau must notify the authorities in charge of the enforcement of the immigration laws at the port of the entrance of immigrants found to be insane, idiotic, imbecile, or epileptic and insane aliens who are or become public charges and arrange for their deportation. The bureau must further notify the commission of the location of non-residents, and the commission must give the bureau the necessary authority for their investigation and removal. Upon the request of any indigent insane persons or on the written consent of their relatives, legal representatives or qualified friends, the bureau may remove such patients to any

country, state, or place to which they belong. In making transfers and removals, the bureau is required as far as practicable to employ nurses and must employ female nurses or attendants to accompany female patients unless it is certified by the medical superintendent that they are in condition to travel alone in safety.

Institutions for the care and treatment of the insane for compensation must be licensed by the hospital commission. Application for license must be accompanied by a plan of the premises proposed to be occupied, with such other information, and in such form as the commission may require. The commission may at any time investigate how far a licensed institution is conducted in compliance with the license, and may, if the interests of the inmates of an institution require it, amend or revoke any license granted.

When the commission has reason to believe that any person adjudged insane is wrongfully deprived of his liberty, or is cruelly or improperly treated, or inadequate provision is made for his care and safekeeping, it may order an investigation of the facts, compel the attendance of witnesses and the production of papers, and exercise the powers of a referee in the supreme court. If the order made by the commission for remedial treatment is just and reasonable, and approved by a justice of the supreme court, it is binding upon any and all institutions to whom it is directed, and any wilful disobedience of it is a crime. When the commission undertakes an investigation into the general management of an institution for the insane, it may give notice to the attorney general, who must appear personally or by deputy and examine the witnesses. The commission may at any time visit and examine inmates of any county or city almshouses to ascertain if insane persons are kept therein.

The authorities of each institution for the insane must place on file in the office of the institution the recommendations made by the commissioners as a result of their visits, for the purpose of consultation by such authorities and for reference by the commissioners upon their visits.

Justices of the supreme court are authorized to appoint visitors to state hospitals, upon nomination of the State Charities' Aid Association.

The hospital development commission consists of the state engineer, the chairman of the state hospital commission, the state architect, the chairman of the senate finance committee, the chairman of the assembly ways and means committee, two members appointed by the governor, and one member of the legislature who is appointed by the minority leaders of the senate and the assembly from one of the financial committees of the legislature.

The commission has charge of the construction of the state hospitals, must adopt a general plan of hospital development, provide for the proper accommodation of surplus patients and make recommendations to the legislature.

(b) *Institutional*.—Each state hospital is under the control of a board of managers, subject to the powers of the commission, consist-

ing of seven members, of whom two must be women, appointed by the governor for terms of seven years. If any manager fails to attend for six months the regular meeting of his board without due excuse, his place may be declared vacant.

The managers, who do not receive any compensation for their services, have control of all the property and the general direction of the internal affairs of the institution to which they are appointed, subject to the powers of the commission. The rules and regulations must be uniform for all the state hospitals. The superintendent of each hospital is required personally to submit at each monthly meeting of the board a report showing the changes in population, health of patients, officers, and employees, accidents, suicides, unusual sickness, etc.

The further duties of each board in regard to the general interests of the hospital, maintaining proper inspection, keeping records, holding regular meetings, making reports of the condition of the patients and the institution to the hospital commission, and investigating all charges made against officers or employees of hospitals, etc., are prescribed in detail by law.

The hospital commission has the sole power of appointing the superintendents of the hospitals, but subject to the approval of the board of managers of each hospital. The superintendents must be well-educated physicians, graduates of incorporated medical colleges, and have at least five years' experience in a hospital for the insane. The commission also has authority to transfer superintendents from one hospital to the other. A superintendent may be removed by a vote of the majority of the board of managers for proper cause, if approved by the commission. Charges of misconduct or incompetency against any superintendent may be made to the board of managers of the hospital by the commission.

The superintendents must have an examination made of each patient within five days after his admission. The superintendent of each hospital has the power to appoint resident officers, including a woman physician and other employees, to remove them for cause, and to prescribe their duties. The commission determines the number of resident officers and employees, and may, with the approval of the governor, abolish the office of any of them.

The general duties of the superintendents are prescribed in detail.

A committee consisting of three superintendents, appointed by the commission, establishes by-laws, rules and regulations governing the appointment and duties of officers and employees of all the state hospitals, and for their internal government, discipline, and management. The by-laws and regulations which must be uniform for all the hospitals are subject to the approval of the commission and the quarterly conference of superintendents and managers with the commission.

The several superintendents of the hospitals must hold joint meetings at least once in three months to consult with the commission



on matters pertaining to institution management, and particularly with reference to the care and treatment of patients.

The law specifies minutely regulations in regard to allowances, salaries, and wages; estimates of expenditures; the powers and duties of the treasurer and steward.

The hospitals for the criminal insane are under the control of the state superintendent of prisons, who appoints the superintendent, and subject to the approval of the hospital commission makes rules and regulations for the government of these institutions.

**2. Care.**—(a) *In State Institutions.*—Utica State Hospital, Utica; established 1836; 1671 beds.

Matteawan State Hospital, Beacon; established 1855; 887 beds (for criminal insane).

Willard State Hospital, Willard; established 1865; 2397 beds.

Hudson River State Hospital, Poughkeepsie; established 1867; 3409 beds.

Middletown State Homeopathic Hospital, Middletown; established 1870; 2235 beds.

Buffalo State Hospital, Buffalo; established 1870; 2171 beds.

Binghamton State Hospital, Binghamton; established 1879; 2746 beds.

St. Lawrence State Hospital, Ogdensburg; established 1886; 2252 beds.

Central Islip State Hospital, Central Islip; established 1889; 5000 beds.

Rochester State Hospital, Rochester; established 1891; 1627 beds.

Kings Park State Hospital, Kings Park; established 1895; 4373 beds.

Brooklyn State Hospital, Brooklyn; established 1895; 864 beds.

Gowanda State Homeopathic Hospital, Collins; established 1896; 1287 beds.

Manhattan State Hospital, Ward's Island, New York City; established 1896; 5004 beds.

Dannemora State Hospital, Dannemora; established 1899; 550 beds (for insane convicts).

The state psychiatric institute is located on Ward's Island, New York City.

(b) *In Local Institutions.*—There are no local public institutions for the insane, although there are maintained in several cities—*e. g.*, Albany, Brooklyn, New York, and Syracuse—psychopathic hospitals or psychopathic wards in connection with general hospitals where the insane are received for observation and treatment. If the cases appear to be chronic or of long duration, they are committed from these psychopathic wards or hospitals to the district state hospital. A psychopathic hospital has also been established at the state reformatory for women. Insane persons may not be committed to an almshouse.

**3. Commitment.**—(a) *Persons Committed.*—All insane persons, not

idiots, who are residents of the state and citizens are entitled to admission to the state hospitals for the insane. Epileptics and feeble-minded persons becoming insane may be committed to a state hospital.

The commission may authorize the superintendent of a state hospital to admit under special agreement insane persons who are residents of the state, other than poor and indigent, when there is room for them. No such patient is permitted to occupy more than one room in any state hospital. The payment of the cost of maintenance must be secured by a surety company bond. The commission has power to demand the removal of such patients to duly licensed private institutions.

(b) *Legal Procedure in Commitment.*—A person alleged to be insane, who is not confined upon a criminal charge, may be committed to an institution for the insane by an order made by a judge of a court of record of the city or county, or a justice of the supreme court of the judicial district, in which he resides, upon a certificate by two qualified medical examiners in lunacy, accompanied by a verified petition, or upon such certificate and petition after a hearing to determine the question. The hospital commission furnishes blanks for such certificates and petitions. An insane person may be committed only to a state hospital, a duly licensed institution for the insane or the hospitals for the criminal insane, or to the care and custody of relatives or a committee.

The certificate of lunacy must be made out by two reputable physicians, graduates of an incorporated medical college, who have been in actual practice at least three years, and have filed with the commission a copy of the certificate of a judge of a court of record, showing such qualifications in accordance with the forms prescribed by the commission. The physicians must jointly make a final examination within ten days before the order is granted. The certificate must contain the facts and circumstances upon which the judgment of the physicians is based and state that the condition of the person requires care and treatment in an institution for the insane. Neither of the physicians may be a relative of the person or have any interest in the institution to which it is proposed to commit him.

Any person with whom an alleged insane person lives, or his near relatives, or the next of kin available, or the committee of his person, or an officer of any well-recognized charitable institution, and any overseer or superintendent of the poor, may apply for an order of commitment by presenting a verified petition containing a statement of the facts in the case, accompanied by the prescribed certificate of lunacy of the medical examiners. Notice of the application must be served personally upon the person alleged to be insane at least one day before it is made; and if made by an overseer or superintendent of the poor, notice must also be served upon the relatives of the alleged insane person, or if relatives are not known, then upon the person with whom he resides.

If no demand is made for a hearing on behalf of the alleged insane

person, the judge may proceed to determine the question of insanity, and if satisfied that he is insane, may immediately issue an order for his commitment. But if it appears that he is harmless and that relatives or a committee are willing and able to care for him at some other place, the judge may order him placed in the care of the relatives or committee. The judge may require other proofs in addition to the petition and medical certificate.

Upon demand, or upon his own motion, the judge may direct a hearing to be held on application within five days, at which he must hear the testimony and examine the alleged insane person if deemed advisable, in or out of court. If the person is found insane, the judge must forthwith order him committed to an institution for the insane or make other provision. If the judge cannot hear the application himself, he may name some referee to hear the testimony and report to him. The order of commitment to a state hospital must be accompanied by a written statement of the judge in regard to the financial condition of the insane person and persons liable for his support. The superintendent of the hospital must be notified of the commitment and at once make provision for the transfer of the insane person to the hospital.

The petition of the applicant, the certificate of the medical examiners, the order directing a hearing, if one be issued, and the decision of the judge or referee, and the order of commitment must be presented at the time of the commitment to the superintendent of the institution, and copies forwarded by him to the state hospital commission. The same obligations in regard to the papers in the case rest upon relatives or committee to whose care an insane person is committed.

The superintendent of any institution for the insane may refuse to receive a person committed if the papers do not comply with the above provisions, or if, in his judgment, the person is not insane within the meaning of the statute, or if received, he may be discharged by the commission. No person may be admitted to any such institution after the expiration of ten days from the date of the order of commitment.

If an insane person needs immediate care and treatment, or is dangerously insane, he must at once be received by a state or licensed institution authorized by law to care for the insane on a certificate of lunacy executed by two medical examiners in lunacy after examination upon the presentation of a proper petition, but may not be retained for a period exceeding ten days. Prior to the expiration of this time, an order for his commitment must be obtained as provided by law. The superintendent of any institution may refuse to receive an insane person upon such certificate and petition if, in his judgment, the reasons alleged are not sufficient, or if the condition of the patient is not of such a character as to make it necessary that he should receive immediate treatment.

County superintendents and overseers of the poor, health officers, and others having to do with the poor must see that indigent insane



persons are timely granted the necessary relief. They must notify the proper health officer of the presence of the insane person, who must see that proceedings are taken for his examination and commitment to a state hospital. When directed by the health officer, it is the duty of the poor officer to make application for the person's commitment. Pending the examination, commitment, and delivery to the hospital, the health officer must see to it that the insane person is properly cared for. In the boroughs of Manhattan and the Bronx the duties prescribed in this paragraph devolve upon the trustees of Bellevue and Allied Hospitals, and in the other boroughs of New York City and in the county of Albany upon the commissioner of public charities.

The trustees of Bellevue and Allied Hospitals, or the commissioner of public charities of New York City or of Albany county, must see that proceedings are taken to determine the mental condition of any person from their locality who is reported insane, and when necessary that his commitment to an institution for the insane is secured; provided, that the report is made by one with whom the alleged person lives, or a near relative, or a licensed physician, or a peace officer, or by a representative of an incorporated charitable society. When it is reported to the above authorities that an apparently insane person resides within their respective boroughs, they must send a nurse or a medical examiner in lunacy, attached to the psychopathic ward of their institution to see the alleged insane person. If, in the judgment of the chief resident alienist of the respective psychopathic wards or of the medical examiners, the person needs immediate care and treatment or should be placed under observation, he must be removed to the psychopathic ward, for not over ten days, due notice being given his relatives.

When a person has been ordered committed, the local officials must have him transferred without unnecessary delay to a proper state hospital. In no case may an insane person be confined in any other place than a state hospital or licensed private institution for the insane for more than ten days, nor be committed as a disorderly person to a prison for criminals. The local authorities may provide a plan for the temporary care of alleged insane persons, subject to the approval of the commission.

An apparently insane person may be arrested if disorderly by any peace officer, who must notify the proper authorities at once. In New York City a magistrate may, upon proper information, issue a warrant for the apprehension of an apparently insane person. If the person appears upon arraignment to be insane the magistrate must commit him to the custody of the trustees of Bellevue and Allied Hospitals, or to the commissioner of public charities, as the case may be, who shall take measures for the determination of his mental condition.

When an insane person has sufficient property to maintain himself or those liable for his support are able to do so, and he is dangerously insane, the committee of his person and estate or his relatives must

provide a suitable place for his confinement, subject to the approval of the local health officer. The local health officers or, in the boroughs of Manhattan and the Bronx (New York City), the board of trustees of Bellevue and Allied Hospitals, and in the boroughs of Brooklyn, Queens, and Richmond (New York City), and the county of Albany, the commissioner of public charities are required to see that the above provision is complied with in the most humane and speedy manner. If the committee of his person or relatives refuse or neglect to care for the insane person, application must be made by the officials named to a judge of a court of record of the city or county, or a justice of the supreme court of the judicial district in which such insane person may reside, for his apprehension and confinement. Unless an order of commitment has been previously granted, application must be made by the officers named for his commitment to the proper institution, and they must take the necessary legal steps to have him sent to such institution. Pending transfer the officers in question must have the insane person cared for in a suitable place and provided with proper medical care and nursing.

Any person needing immediate care and treatment because of mental derangement other than delirium tremens or drunkenness may be admitted to a state hospital on the written request of a health officer on an approved form. Unless the patient signs a request to remain as a voluntary patient he must be examined and committed in the usual way within ten days. The superintendent may refuse to receive a patient who is deemed by him not suitable for such care.

(c) *Voluntary Admission.*—The superintendent of any state hospital or licensed private institution for the insane, except the Matteawan and Dannemora State Hospitals may, subject to the regulations of the state hospital commission, receive and retain as a patient any suitable person who voluntarily makes written application for admission, and whose mental condition is such as to render him competent to make it; but he may not be detained for more than ten days after having given notice of his intention or desire to leave the hospital.

Within three days after the admission of a voluntary patient the superintendent of a state hospital must send a record of the patient to the state hospital commission. The superintendent in charge of a licensed private institution for the insane must furnish the medical commissioner or medical inspector a complete list of all voluntary cases since his last visit. The commissioner or inspector must examine such cases and determine whether they belong to the voluntary class. His decision as to their commitment or discharge must at once be complied with. Failure to conform with these requirements is sufficient cause for the revocation of the license of a private institution.

(d) *Appeal from Commitment.*—If a person ordered to be committed, or any one representing him, is dissatisfied with the order of the judge, he may within thirty days after the order is made obtain a rehearing and review of the proceedings upon petition to a justice of the supreme

court other than the justice making the order of commitment. The justice must summon a jury and try the question of the insanity of the person committed. If the petitioner is other than the person committed, or his near relative, or the one with whom he resided, security must be furnished for payment of the costs of the proceedings. If the person is found to be sane he must forthwith be discharged, but if insane, the justice must certify the fact and order recommitment as upon the original hearing. If a judge or justice refuses to grant an application for an order of commitment of an insane person proved to be dangerous to himself or others, he must state his reasons for refusal in writing, and any person aggrieved thereby may obtain a rehearing and review, and a determination of the question of insanity by a jury.

Any one held as insane is entitled to a writ of habeas corpus on application made by him or by a friend. At the hearing the medical history of the patient must be given in evidence, and the superintendent or medical officer in charge must testify under oath.

(e) *Cost of Commitment.*—The cost of determining the insanity of an indigent person and in securing his admission to a state hospital, including the expense of proper clothing, medical care, and nursing, is a charge upon the town, city, or county securing the commitment. If the person is not indigent, the cost paid by a town, city, or county may be collected from his estate or from the persons liable for his maintenance.

**4. Conveying Patients to the Hospital.**—The hospital to which a patient is committed must send a trained attendant to bring him to it. Each female patient must be accompanied by a female attendant, unless accompanied by her father, brother, husband, or son. The commission may prohibit the employment of an attendant it deems unfit.

**5. Transfer of Patients.**—In case of overcrowding, or for other reasons, the state hospital commission may order the transfer of patients from one state hospital to another, at the expense of the state.

**6. Parole and Discharge of Patients.**—The superintendent of a state hospital may grant a parole to a patient not exceeding one year, under the general conditions prescribed by the commission, during which time the hospital is not liable for his expenses, which are then a charge upon the committee or person to whom he is paroled.

The superintendent of a state hospital, on filing his written certificate with the commission, may discharge any patient, except one held upon an order of the court having criminal jurisdiction in an action or proceeding arising out of a criminal offense, as follows: (1) a patient who has recovered; (2) a patient who is a dotard, not insane; (3) any patient who has not recovered, but whose discharge will not be detrimental to the public welfare or injurious to himself; provided, that the superintendent is satisfied that friends or relatives of the patient are willing and able properly to care for him after discharge.



When the superintendent is unwilling to certify to the discharge of an unrecovered patient, any judge of the court of record in the district in which the hospital is situated may inquire into the case and, upon proofs, having accorded the superintendent a hearing, direct the discharge of this patient upon such security as he may require.

The commission may discharge any patient who, in its judgment is improperly detained in any institution. Poor and indigent persons discharged by the superintendent as idiots, dotards, or as epileptics, not insane, or because not proper cases for treatment, must be received and cared for by the superintendent of the poor or other authority having similar power in the county from which he was committed. A patient held upon an order of a criminal court in an action arising from a criminal offense may be discharged upon the superintendent's certificate of recovery, approved by the court.

No patient may be discharged or paroled from a state hospital without suitable clothing and money. If they cannot be otherwise obtained, the steward must, upon the order of the superintendent, furnish the clothing and money, not exceeding \$25, to defray his expenses until he can reach his relatives or friends or find employment.

The superintendent of a licensed private institution may parole a patient for not more than one year, under conditions prescribed by the commission. He may discharge, on filing his certificate with the commission, a recovered patient or one who has not recovered if it is not detrimental to public welfare or injurious to the patient. The superintendent, subject to the approval of the commission, may apply for the transfer of a patient to a state hospital whom he refuses to discharge and for whom relatives or friends refuse to provide care and treatment.

Poor and indigent persons committed to a state hospital who have not a legal settlement in the state of New York may be returned by the hospital commission, either before or after their admission to a state hospital, to the county or state to which they belong upon an order issued by any judge.

**7. Cost of Maintenance.**—All poor and indigent insane persons, not in confinement under criminal proceedings, committed to state hospitals, are wholly supported by the state. The cost of transfer of patients to state hospitals is a charge upon the state. The hospital commission must secure from the patient's estate and from relatives or friends liable or willing to assume the costs of support, reimbursement at the rate fixed by the commission, in whole or in part. The commission may waive the whole or a portion of the claim of the state against the estate of a patient, when the court by which the committee was appointed has directed the committee to apply any part of the patient's estate for the maintenance of his family. The commission may appoint agents to secure from relatives and friends who are liable or willing to assume the cost of support reimbursement, in whole or in part. The commission may fix the rate to be paid for the support of an inmate of a state hospital by the committee of the patient or

by relatives liable for his support, or by persons willing to assume the cost. The maintenance of any inmate of a state hospital, committed upon a court order arising out of any criminal action, must be paid by the county from which the inmate was committed.

The father, mother, husband, wife, or children of an insane person, if of sufficient ability, and his guardian, if the estate is sufficient, must maintain him.

**8. Criminal Insane.**—If the defense of insanity is made in a criminal case, and the jury acquit the defendant on that ground, the court may order him committed to a state hospital until he becomes sane.

If the court believes a defendant to be insane the question of his insanity must be tried; and if he is found insane, he must be committed to a state hospital.

When a defendant pleads insanity, the court may appoint a commission of not more than three disinterested persons to examine him and report as to his sanity. The same procedure may be taken in case the defendant is in confinement under indictment and appears to be insane. In either case the commission must at once make examination, to be attended by the district attorney, and the counsel of the defendant may take part in the proceedings.

If the commission finds the defendant insane, and the court deems his discharge dangerous, the judge must order him committed by the sheriff to a state hospital, and to be delivered by the superintendent to the sheriff upon his recovery, in which case the superintendent must notify the judge of the circuit court of the district in which the hospital is situated, whereupon the defendant must be brought back to trial, judgment, execution, or be legally discharged.

The expenses in such cases are chargeable upon the county from which he was sent, which may, however, recover from the estate of the defendant or from a relative, town, city, or county, bound to provide for him.

Whenever the physician of the state prison for women, of any county penitentiary or workhouse, of any reformatory for women, or of the state reformatory or of any other penal institution, reports that a person undergoing a sentence of one year or less or convicted of a misdemeanor, or any female convict, is insane, the warden may apply to a judge of a court of record for an examination of the person by two legally qualified examiners in lunacy, other than the physician connected with the penal institution where the alleged insane person is in confinement. If the examiners in lunacy are satisfied that the convict is insane, the warden must apply to a judge of a court of record for an order transferring the person to the Matteawan State Hospital. This hospital is established for the purpose of caring for insane persons committed by the criminal courts or transferred to it by the state hospital commission, and for convicted persons who are declared insane while undergoing sentence for a year or less or for a misdemeanor and for all female convicts.

When a convict in the Matteawan State Hospital is found insane

at the expiration of the term for which he was sentenced, he may be retained until he has recovered or is otherwise legally discharged. The medical superintendent of the hospital may discharge and deliver any patient whose sentence has expired and who is still insane but for whom it is safe to be at large, to his relatives or friends who are able and willing to maintain him without further public charge. When a convict recovers who has been retained in a hospital as insane beyond the expiration of his sentence, the superintendent may discharge him, and the convict is then entitled to the sum of \$10, suitable clothing, and a railroad ticket to his county. Any convict whose term of imprisonment has expired and who has not recovered may be transferred to a state hospital on the order of the commission.

The state hospital commission may order any insane inmate of a state hospital to be transferred to the Matteawan State Hospital, who has been committed upon the order of a court of criminal jurisdiction; it may also order such transfer of any person who has previously been sentenced to a term of imprisonment in any penal institution, and who still manifests criminal tendencies, or any patient who has previously been an inmate of the Matteawan State Hospital.

The Dannemora State Hospital is for male prisoners only, who have been confined in state prisons, reformatories, or penitentiaries for a felony.

When the physician of any one of the above-mentioned penal institutions certifies to the warden that a male prisoner is insane, the warden must have him transferred to the Dannemora State Hospital, to be retained there until legally discharged.

When a convict in the Dannemora State Hospital, whose term has expired, continues insane, the medical superintendent must apply to the judge of a court of record for the examination of the convict by two physicians qualified as medical examiners in lunacy, other than the physician of the hospital. If the examiners appointed by the court are satisfied that the convict is insane, they must certify to the fact in the manner prescribed for the commitment of insane to state hospitals. The judge, if satisfied that the convict continues insane, must order the superintendent to retain him until discharged, as provided by law.

A convict whose sentence has expired and who is still insane, but who is reasonably safe to be at large, may be discharged to relatives or friends able and willing comfortably to maintain him without further public expense; and such convict may be given the whole or a portion of the allowances granted to recovered convicts.

When a convict recovers who has been retained beyond the expiration of his sentence because of insanity, he may be discharged and is then entitled to \$10, suitable clothing, and transportation to the county of his conviction or other place he may designate at no greater distance.

Any unrecovered convict in the hospital whose term of imprison-



ment has expired may be transferred to any institution for the insane upon an order of the state hospital commission.

Strict rules are established to prevent unauthorized communication with or by convict patients, but letters written by the latter to the county judge or district attorney of the county from which they were sentenced must be forwarded after examination by the medical superintendent.

## NORTH CAROLINA

### Authorities:

Pell's Revisal of the Laws of North Carolina, 1908  
Session Laws, 1915, 1917

**1. Administration and Supervision.**—(a) *General.*—The board of public charities is composed of five members, recommended by the governor and elected by the concurrent vote of the general assembly for terms of six years. The board must investigate and supervise the whole system of charitable and penal institutions of the state and report biennially to the general assembly. When the board believes that any curable insane person is not properly cared for in an almshouse or other place, whether he is a public charge or not, it must have him removed to a state hospital for the insane. The board may at any time request reports from the superintendents or other officers of charitable institutions and any desired statistics. Private hospitals for the care of the insane must be licensed by the board and are subject to its inspection and supervision.

The board of internal improvements consists of the governor and two others appointed by him. They have the duty of investigation of public institutions.

The state hospitals for the insane are under the management of a general board of directors consisting of nine members, no two of whom may be residents of the same county, appointed by the governor for terms of six years. They receive \$4 a day and expenses while engaged in official duties. The board directs and manages the affairs of the three hospitals, appoints the superintendents, and fixes the salaries of all officers and employees. A meeting must be held at each institution at least once each year, and at such other times as necessary. Biennial reports must be made to the legislature.

A co-operative purchasing committee, called "the committee," consisting of the superintendents of six of the larger state institutions and including the three state hospitals for the insane, meets at least four times a year, three members constituting a quorum, to make such rules and regulations as it deems necessary for the economical purchase of supplies for the state institutions represented. Other state institutions not represented on the committee must report to it regarding all supplies purchased by them, and may request the committee to purchase their supplies. The committee reports quarterly to the governor and publishes an annual report.

(b) *Institutional.*—Three members of the general board of directors are appointed from the Morganton hospital district, three from the

Raleigh hospital district, and three from the state at large. The members from each district constitute the executive committee for the hospital of the district, and the three members appointed from the state at large are the executive committee for the hospital for the insane at Goldsboro. The superintendent must be a skilled physician of good moral character, and holds office for six years, subject to removal by the board for cause. The superintendent has exclusive control of the subordinate officers and employees he appoints and may remove them for cause.

The state hospital for the dangerous insane is under the management of the board of directors of the state prison.

2. **Care.**—(a) *In State Institutions.*—State Hospital, Raleigh; established 1856; 1000 beds.

State Hospital for the Insane, Morganton; established 1880; 1360 beds.

State Hospital, Goldsboro; established 1880; 860 beds (for negro patients).

State Hospital for Dangerous Insane, Raleigh, established 1898; 70 beds.

(b) *In Local Institutions.*—Any county, city, or town may establish a hospital for the care of insane persons who cannot be admitted to a state hospital. Otherwise such insane, when chargeable upon the county, may be provided for in the county homes which are under the control of the board of commissioners of each county.

3. **Commitment.**—(a) *Persons Committed.*—All insane persons, except idiots, who are citizens and residents of the state, are entitled to admission to the state hospitals; but admission may be refused persons who recently have been exposed to contagious or infectious disease.

(b) *Legal Procedure in Commitment.*—Some respectable citizen residing in the county of the alleged insane persons must file an affidavit with a clerk of the superior court of the county that the person in question is a fit subject for admission to a state hospital. The clerk may then have the alleged insane person brought before him or go to his residence, and examine into the condition of his mind, with the assistance of the county physician, and the advice of other reputable physicians. He must take the testimony of at least one recognized physician, resident of the state, and if possible, of a member of his family or friend. If the clerk decides that such person is insane, and some friend will not give bond guaranteeing his good behavior, and to keep and support him until the cause for confinement ceases, the clerk must order his removal to the proper hospital, and submit to the board of directors the examination of the witnesses. In an emergency the examination may be made by a justice of the peace, who is required to report to the clerk of the superior court. But the order for commitment must be issued by the clerk. In cases of great emergency, a justice may admit a patient to a hospital, but must procure an order from the clerk to the superintendent within thirty days. Whenever any citizen or resident of the state becomes

suddenly or violently insane in some county other than that of his settlement, the proper authorities of any county in which he is have authority to examine him, and to commit him to the hospital to which he would be sent had he been committed from the county of his own settlement. Transcripts of the proceedings in such cases must be sent to the clerk of the county in which he is settled, in order that all the costs of examination and commitment may be borne by the proper county.

If a citizen or resident of another state is found to be insane, the clerk of the superior court must notify the governor of the state in which the insane person is a citizen; and, for a reasonable length of time, the insane person must be kept in restraint, but must not be committed to any state hospital. If no provision is made by his own state for removal within a reasonable time, the county commissioners of the county in which he was found insane must send him to the state in which he is a citizen, and deliver him to the proper authorities. No person who has moved into the state while insane may be deemed a resident. Knowingly to commit a non-resident to a hospital for the insane is a misdemeanor.

When an alien is ascertained to be insane the clerk of the superior court must immediately notify the governor of his state of all the facts and transmit a copy of the examination taken. This information and examination must thereupon be transmitted to the federal authorities with a request for the deportation of the insane person.

In the admission of patients to any state hospital, priority must be given to the indigent insane, with due regard to the curability of patients, and the exigencies of particular cases. It is permissible, however, to admit other than indigent patients if there be sufficient room.

Inebriates of both sexes may be admitted to hospitals for the insane, but not without pay; and not more than twelve of each sex. Inebriates are committed in the same manner as the insane, except that the admission of every inebriate is for a specified time, not exceeding twelve months and not less than three months. If any inebriate while under treatment at a hospital is found to be insane, he must be detained and treated as any other insane person under order of the board of directors, due report having been made to the clerk of the proper county.

(c) *Voluntary Admission*.—Provision is made for the voluntary admission of patients. An application for voluntary admission must be accompanied by the certificate of a licensed physician, stating that the applicant is a fit subject for admission. No certificate of the clerk of the superior court is necessary. A voluntary patient is not entitled to a discharge until he has given the superintendent ten days' notice of his desire to be discharged.

(d) *Appeal from Commitment*.—Every person restrained of his liberty is entitled to an inquiry as to its lawfulness and to have the same removed if unlawful.



(e) *Cost of Commitment.*—The cost of committing a patient to a hospital, or removing him, must be paid by himself if the board of county commissioners are satisfied that he has sufficient property, or by any person liable for his support or maintenance, or by the county in which he has a legal settlement. If any person is found to possess sufficient property to support those who may be legally dependent upon his estate, he may be placed in any hospital without the state or in a private hospital, instead of in a state hospital; it is lawful to place him in the house he has chosen.

4. **Conveying Patients to the Hospital.**—The superintendent of the hospital to which a patient has been committed provides an attendant to convey him, and renders a bill for cost of transportation to the board of commissioners of the county.

5. **Transfer of Patients.** 6. **Parole and Discharge of Patients.**—Each superintendent may, for the space of thirty days or until the next meeting of the board of directors, discharge any patient upon probation if, in his opinion, it will not be dangerous to do so. A report of any such probation must be made to the board of discharge.

It is the duty of the board of county commissioners, by proper order, to discharge any ascertained insane person in their county, not admitted to the appropriate hospital, and not committed for crime, when it appears upon the certificate of two respectable physicians that such insane person ought to be discharged if in a hospital. If the superintendent of the hospital doubt the propriety of the admission of patients, he may place the matter before a board consisting of any three directors of the hospital. If such board so decide, the person in question shall be received into the hospital, but a like board may at any time thereafter discharge him to any friend who will become surety for his conduct and proper care. Any three of the board of directors of a hospital may, upon the certification of the superintendent, discharge from the hospital any person admitted as insane, when he is found to be sane, or has recovered, or is an incurable who can safely be allowed at liberty, or the board may release such a person to the county of his settlement on probation. The board may discharge or remove an insane person upon other sufficient causes.

7. **Cost of Maintenance.**—Indigent insane patients are supported in hospitals at the expense of the state. An insane person, who is able to pay expenses, is not entitled to free admission, and the superintendent has no power to bind the state to support him.

8. **Criminal Insane.**—All persons committing crime while insane, who therefore cannot be tried for their offense, are to be treated as dangerous insane. When a person confined as dangerous insane and against whom indictment for crime is pending has recovered, it is the duty of the superintendent of the hospital to notify the clerk of the county, who shall take the case to the superior court of his county for trial, and the person must not be discharged without an order from the court. Persons accused of capital crimes and certain other grave offenses, who escape indictment, or who are acquitted on the ground of

insanity must be committed to the hospital for the dangerous insane. In the event of their recovery, it is the duty of the sheriff of the county from which they came to take them before the judge of the superior court of the district to be dealt with according to law.

No person acquitted of capital felony on the ground of insanity and committed to the hospital for the dangerous insane may be discharged except by authorization of the general assembly. A person acquitted of crime of a lower degree than a capital felony must not be discharged except upon an order from the governor. In other cases the consent to the discharge of the judge of the district is necessary.

When a person who has been confined in the state's prison for felonious murder, and who has been discharged at the expiration of his sentence, or as the result of executive clemency, thereafter so acts as to justify the belief that he is possessed of a homicidal mania, and is duly adjudged insane, the clerk of the superior court or other officer having jurisdiction of the proceedings may, in his discretion, commit him to the state hospital for the dangerous insane, or to one of the other state hospitals for the insane.

A convict in the state prison becoming insane must be admitted to the hospital for dangerous insane. If still insane at the expiration of his sentence, he must be held until he becomes sane or is considered harmless and incurable.

## NORTH DAKOTA

### Authorities:

Compiled Laws of North Dakota, 1913

Laws of North Dakota, 1915, 1917, 1918

**1. Administration and Supervision.**—(a) *General.*—The board of control of state institutions consists of three members appointed by the governor, with the consent of the senate for terms of six years. The chairman of the board is designated by the governor for each biennial period. The members receive a salary of \$3000 per annum and expenses, and are subject to removal by the governor.

The board is charged with the management of the charitable and correctional institutions of the state, and with the investigation of the methods of caring for the insane, delinquent, and criminal classes.

The board of control manages and controls the state hospital for the insane, and makes all by-laws and regulations necessary for its government.

The commissioners of insanity (see 3 (b)) in each organized county are responsible for the safekeeping of the insane in their respective counties.

(b) *Institutional.*—The superintendent of the hospital is appointed by the board of control. He must be a physician of acknowledged skill and ability, a graduate of a reputable medical college; and must give a bond to the state for \$10,000, conditioned for the faithful discharge of the duties of his office, to be approved by the board. In addition to having the entire control of the medical, moral, and

dietetic treatment of the patients, he appoints all employees and assistants necessary for the institution except the steward and matron, who are appointed by the board of control, and may discharge any of these employees at will and suspend any resident officer of the hospital, except the steward, being responsible to the board for the proper exercise of this power.

**2. Care.**—(a) *In State Institutions.*—North Dakota State Hospital for the Insane, Jamestown; established, 1883; beds, 750.

¶(b) *In Local Institutions.*—The county commissioners, who are the overseers of the poor, must provide for the indigent insane of their respective counties who cannot be received at the state hospital, and may care for them in the county asylum when one has been established.

**3. Commitment.**—(a) *Persons Committed.*—All resident insane of the state who are not idiots are entitled to receive care and treatment at the state hospital. Residents of other states may be admitted to the hospital upon payment of the cost of board and treatment, but not to exclusion of resident insane.

(b) *Legal Procedure in Commitment.*—In each organized county there is a board, consisting of three persons, known as “commissioners of insanity.” The county judge is a member of the board and its chairman. The other two members are appointed by the board of county commissioners, one of whom must be a reputable practising physician, and the other a reputable practising attorney, the term of appointment being for two years. In case of the temporary absence of the commissioners or their inability to act, the county judge calls to his aid a reputable practising physician or attorney. The commissioners have cognizance of all applications for admission to the hospital. They have power to issue subpoenas and to administer oaths.

Applications for admission to the hospital must be made in writing, verified by affidavit, alleging that the person in whose behalf the application is made is believed to be insane and needs custody and treatment in the hospital for the insane. The commissioners must at once investigate the grounds for the application and may require the person for whom admission is sought to be brought before them for examination. Any citizen of the county or any relative of the person alleged to be insane may appear and resist the application, and the parties may appear by counsel. The commissioners, whether they decide to dispense with the presence of the person alleged to be insane or not, must appoint some regular practising physician of the county, who may be of their own number, to make a personal examination of him. The physician appointed must certify that he has made a careful personal examination, and that he finds the person insane or not insane. In connection with the examination the physician must endeavor to obtain from the relatives of the person, or from others, correct answers to the interrogatories required by the law. If the commissioners find the person insane and a proper subject for treatment at the hospital, they must authorize the superintendent to receive him.



If it becomes necessary, for want of room or other cause, to discriminate in the reception of patients into the hospital, a selection must be made as follows: (1) cases of less than one year's duration; (2) chronic cases of more than one year's duration presenting the most favorable prospects for recovery; (3) those for whom application has been longest on file; (4) when cases are equally meritorious in all other respects, the indigent are to be preferred.

When persons found to be insane cannot at once be admitted to the hospital nor safely be allowed at liberty, the commissioners must require them to be suitably provided for otherwise until admission can be had, or until the occasion therefor no longer exists. If such a person is to be cared for without public charge, the commissioners must appoint a special custodian for him. In the case of public patients, the commissioners must require that they be cared for by the overseers of the poor. If there is no poorhouse for their reception, or no more suitable place can be found, they may be confined in the county jail; or the commissioners, in their discretion, may require them to be taken to a hospital of any state that may be designated by the governor, who is authorized to make the best terms he can for the admission of such patients.

On application to the commissioners on behalf of persons alleged to be insane and whose admission to the hospital is not sought, asking that provision be made for their care as insane, either as public or private charges, within the county, the commissioners, on proof of their insanity, may provide for them as in other cases.

Insane persons who have been under care outside of the hospital may, on application, be transferred to the state hospital whenever they can be admitted thereto, on the warrant of the commissioners. Such admission may be had within six months without another inquest, unless the commissioners deem a further inquest advisable.

No person supposed to be insane may be restrained of his liberty by any other person except by authority obtained as herein required, save to such extent and for such brief period as may be necessary for the safety of persons until proper authority can be had.

Any person found by the commissioners of insanity to be insane, who has no legal residence within this state, must be sent at the expense of the state to the place where he belongs, when it can be ascertained.

*(c) Voluntary Admission.*

*(d) Appeal from Commitment.*—On a statement in writing, verified by affidavit to the county judge of the county in which the hospital is situated or of the county in which any person confined in the hospital has his residence, alleging that a person is not insane and is unjustly deprived of his liberty, the judge must appoint a commission of not more than three persons to inquire into the merits of the case, one of whom must be a physician; and if two or more are appointed, one must be an attorney. Their report to the county judge must be signed by the superintendent. Before finding the person sane, the

judge must notify the nearest relative or friend and all who testified at the hearing at which the person was found insane to appear before him within five days and give testimony. If, on their report, the county judge finds the person sane, he must order his discharge; if not, he must authorize his continued detention. The commission so provided for may not be repeated oftener than once in six months for the same person, and no commission may be appointed in the case of any patient within six months of the time of his admission.

All persons confined as insane are entitled to the benefit of the writ of habeas corpus. If the judge decides that a person is insane, this is no bar to the issuance of the writ a second time whenever it is alleged that he has been restored to reason.

(c) *Cost of Commitment.*—The expense of committing an insane person to the hospital, including the fees to the commissioners of insanity, the judge, and the examining physician, is paid out of the county treasury; but the fee and expenses of the sheriff for conveying a patient to the hospital, or to the authorities of another state, are paid out of the state treasury.

**4. Conveying Patients to the Hospital.**—A state transportation agent or his deputy has the duty of conveying insane persons to the hospital. A female taken to the hospital must be attended by some other female or some relative. The superintendent, in his acknowledgment of delivery, must state whether there was any such person in attendance. If any relative or intimate friend of the patient, who is a suitable person, requests it, he has the privilege of executing the commissioners warrant in preference to the sheriff or any other person.

**5. Transfer of Patients. 6. Parole and Discharge of Patients.**—No patient who is under charge or conviction of homicide may be discharged without order of the board of control.

Any patient who is cured must immediately be discharged by the superintendent and be furnished with suitable clothing and a sum of money not exceeding \$20, which shall be charged to the expenses of the patient in the hospital. The relatives of any patient not susceptible of cure and not dangerous to be at large have the right to remove him with the consent of the board of control. On application of the relatives or immediate friends of any patient in the hospital who is not cured and who cannot safely be allowed to go at liberty, the commissioners of insanity of the county where such patient belongs may authorize his discharge and provide for his care within the county. When a patient is discharged from the hospital, without application, notice must at once be sent to the commissioners of insanity of the county where he belongs, who must have him removed and cared for in the county, as in other cases, unless the patient is discharged as cured. And if the commissioners of insanity of such county neglect to remove such patient within thirty days from the date of the order of discharge, the county is liable to the state for the sum of \$2 per day for the care and keeping of the patient at the hospital. The superintendent of the hospital must report annually all such delinquencies

and the time of any patient kept beyond the period of thirty days to the governor. The amount thus reported is charged to each county named and made a part of the tax levied against the county.

**7. Cost of Maintenance.**—The expense for the care, board, and treatment of all patients in the state hospital is a charge upon each county sending them.

The superintendent must furnish the county auditor of each county having patients in the state hospital a quarterly statement giving the number of patients belonging to the county, the name of each patient, and the cost of his maintenance.

When notified that a patient sent from one county has a legal residence in another, the superintendent must hold and keep him at the expense of the latter county, including expense already incurred and unadjusted.

Expense incurred by one county on account of insane persons whose legal residence is in another county must be refunded by the county of residence.

When the county commissioners of a county make claim that a patient is not a proper charge against their county, and so notify the state auditor, stating that he is a charge against some other county, or against the state at large, the state auditor must notify the county auditors of each of the counties in question to file proofs within thirty days, and after investigation of the residence of the patient determines the matter. The superintendent of the hospital must thereafter treat the patient as from the county determined by the state auditor, and if he finds that the patient is not a proper charge against any county in the state, he must be regarded as a charge against the state at large. Any county may appeal from the determination of the state auditor to the district court of the county.

The expense incurred by any county for the maintenance of a patient at the state hospital is a charge against his estate; provided, that he has no heirs within the United States dependent on the estate for support; and provided, that no real property may be sold during the life of the insane person nor any personal property under five years from the date of sending the patient to the hospital, unless by order of the proper court when the property is liable to deteriorate in value. When it is sold, the county court must order the proceeds to be safely invested for the benefit of the insane person.

The board of control fixes the amount to be paid for the care and treatment of patients. The sum may not exceed \$24 a month for residents of the state. Non-residents are required to pay the actual cost.

**8. Criminal Insane.**—If a jury finds that the defendant in a criminal case is insane, the trial or judgment must be suspended until he becomes sane, and the court must, in the meantime, order him committed to the state hospital for the insane by the sheriff and re-delivered to the sheriff upon becoming sane, to stand trial or judgment or be discharged.

When a jury returns a verdict acquitting a defendant upon the



grounds of insanity, the court may, if the defendant is in custody and it deems his discharge dangerous to the public safety, order him to be committed to the state hospital for the insane or to the care of such person or persons as the court may direct, until he becomes sane.

When any person becomes insane during confinement in the penitentiary or reform school the governor must make inquiry, and if he determines that the person is insane, he must order him confined and treated in the state hospital for the insane, and upon his recovery, if before the expiration of the term for which he is committed, returned to the penal institution from which he was taken.

The superintendent of the hospital must notify the warden or superintendent of the recovery of a person transferred as provided, and the warden or superintendent must, if the term of sentence of the person has not expired, return him to the proper custody. If the term of imprisonment has expired at the time of recovery, the warden or superintendent may direct that he be released from further custody by the superintendent of the hospital.

## OHIO

### Authorities:

Page and Adams Annotated Code of Ohio, 1912  
Supplements, 1913-1915  
Laws of Ohio, 1917

**1. Administration and Supervision.**—(a) *General.*—The board of state charities is composed of seven members, six of whom are appointed by the governor for terms of three years. The governor is ex-officio a member of the board. No more than three of the appointed members may belong to the same political party. The board must investigate the condition and management of all public benevolent and correctional institutions, both state and local. Officers in charge of such institutions must furnish the board the information it requires. The board may prescribe forms of reports and of registration. All plans for new state, county, and city institutions must be submitted to the board for its approval. The governor may order the board to investigate the management of any institution. The board has an agent whose duty it is to investigate the financial condition of the inmates of the institutions and of the relatives liable for their support, and is given special powers to that end. The board has authority to take depositions, administer oaths, and punish for contempt. The board must make a biennial report to the governor.

The governor appoints annually a committee consisting of six women to visit the benevolent and correctional institutions of the state. The committee must visit the institutions at least twice a year and make a complete report of their observations and conclusions to the board of state charities.

All the state charitable, correctional, and penal institutions (including the state hospitals for the insane) are managed and governed by the board of administration. The board is composed of four mem-

bers, not more than two of whom may belong to the same political party, appointed by the governor for terms of four years, and subject to removal by him for cause. Failure on the part of a member to attend three consecutive meetings of the board unless excused by formal vote may be treated by the governor as his resignation.

The members must be selected with regard to their knowledge or experience concerning methods of care and treatment at the institutions, and of business management. Each member receives a salary of \$4000 per annum, and must devote all his time to the duties of his position. The board appoints a fiscal supervisor-secretary, who receives a salary of \$3600 a year, and such other employees as may be necessary, and fixes their compensation. The board has all power and authority necessary for the exercise of the executive, administrative, and fiscal supervision of all state institutions, and succeeds in all respects the former boards of trustees and boards of managers; it regulates the admission and discharge of inmates, as provided by law, including non-resident patients; it divides the state into hospital districts for the purpose of regulating the admission of insane patients, and fixes the quota to which each county is entitled.

The board acts as a commission of lunacy with power to examine into, with or without expert assistance, the question of the sanity or condition of any person committed to or confined in any public or private hospital, or restrained of his liberty by reason of alleged insanity at any place within the state, to order and compel the discharge of any such person who shall not be insane, and to direct what disposition shall be made of him.

The board keeps in its offices a complete set of books and accounts with each institution, showing the nature and amount of every expenditure, and an account of all appropriations. Superintendents make requisition on the board for all supplies, which are purchased by competitive bidding. A record is also kept of each patient committed to the institutions. A member of the board must visit each hospital at least once a month and report to the next meeting of the board. In making necessary investigations, the board is given the powers of a justice of the peace to administer oaths, etc. The board is required to make an annual report in detail to the governor.

(b) *Institutional*.—Each state institution is under the executive control of a superintendent, appointed by the board of administration, subject to the rules and regulations of the state civil service commission. The superintendent, with the approval of the board, selects the employees. The board fixes all salaries.

The board must make rules and regulations to insure a strictly non-partisan management and any member of the board, officer, or employee of any institution, may be removed for exercising political influence and for seeking the employment or promotion of any person at any institution.

The Longview Hospital (a county institution, although under state supervision and receiving a state appropriation for maintenance) is

under a board of five directors all of whom must be residents of Hamilton county. Two are appointed by the governor, one by the judges of the court of common pleas, one by the judge of the probate court, and one by the commissioners of Hamilton county. Each of the directors holds office for five years. The powers and duties of the board are similar to those of the state board of administration so far as the general government of this institution is concerned.

2. **Care.**—(a) *In State Institutions.*—Columbus State Hospital, Columbus; established 1835; 1820 beds.

Cleveland State Hospital, Cleveland; established 1855; 1775 beds.

Dayton State Hospital, Dayton; established 1855; 1279 beds.

Athens State Hospital, Athens; established 1864; 1400 beds.

Toledo State Hospital, Toledo; established 1883; 1810 beds.

Massillon State Hospital, Massillon; established 1892; 1763 beds.

Lima State Hospital for the Criminal Insane, Lima; established 1906; 1200 beds.

(b) *In Local Institutions.*—The Longview Hospital, Cincinnati (established 1821; 1521 beds) is maintained by the state for the exclusive benefit of residents of Hamilton County; the buildings and grounds are owned by the county. Very few insane are maintained at the almshouses or infirmaries. The Cincinnati general hospital has a psychopathic department.

On the request of the probate judge the county commissioners of the county may establish a detention hospital for alleged insane persons in proximity to the probate court, under charge of a registered physician as superintendent, to be appointed by the probate judge. Other necessary assistants are appointed by the superintendent. In counties where a municipality owns a hospital, the county commissioners may contract with it for the temporary care of alleged insane persons.

3. **Commitment.**—(a) *Persons Committed.*—All insane persons, not feeble-minded or epileptics, who are residents of the state may be admitted to the state hospitals, provided their insanity occurred during their residence in the state. Non-residents may be received when authorized by the board of administration, if the legal residence of the person cannot be ascertained or other peculiar circumstances afford a sufficient reason.

If it is found that the person whose commitment is requested has not a legal residence or the residence is in doubt, and the judge of probate believes that the person should be committed to a hospital, he must notify the board of administration to investigate the matter.

The medical superintendent of each state hospital must inform the probate judge of the different counties of the hospital district of the quota of patients to which the county is entitled and the number in the hospital therefrom. The probate judge may at any time commit an acute case if the quota is not full.

(b) *Legal Procedure in Commitment.*—A resident citizen of the proper county must file with the probate judge of the county an affi-



davit in prescribed form alleging the insanity of the person and that he is dangerous to the community if allowed at large, and stating his legal settlement. Within five days after the affidavit is filed, the probate judge must issue a warrant for the apprehension of the alleged insane person, fix a day for the hearing, and summon witnesses, two of whom must be reputable physicians of at least five years' practice.

If any person resists the affidavit, the judge must subpoena the persons demanded on behalf of the person alleged to be insane. The probate judge may examine the person out of court if it is deemed inadvisable to bring him into the court, and the proceedings required may then be held in his absence. After hearing all the testimony and being satisfied that the person is insane, the judge must cause a certificate to be made by two medical witnesses of the person's insanity. The medical witnesses must have at least five years' experience in the practice of medicine, and not be related by blood or marriage to the person alleged to be insane or to the person making the application. The medical certificate must be in the form prescribed by the state board of administration with the advice of the superintendents of the several hospitals. Upon receiving the medical certificate the probate judge must at once apply to the superintendent of the hospital situated in the district in which the patient resides, transmitting at the same time all the papers in the case together with a certificate that the person is free from infectious disease. The superintendent must immediately state whether the patient can be admitted. The proceedings for commitment to the Longview Hospital of Hamilton County are of the same character.

The relatives of a person charged with insanity, or found to be insane, may, with the court's approval, take charge of him if they desire to do so. In such a case, the probate judge before whom the inquest has been held must deliver the insane person to them.

When a person is discharged from a hospital as cured and again becomes insane, the same proceedings must be had as in the case of the original application before he can be again admitted to a hospital for the insane.

(c) *Voluntary Admission*.—A person in an incipient state of mental derangement may apply for admission to the state hospital in the district in which he resides. The superintendent of the hospital may receive the applicant for not more than sixty days if, upon his own examination and the statement of a reputable physician familiar with his condition, he is satisfied that the applicant is in need of hospital treatment and will be benefited by it. The applicant must be an inhabitant of the state and must sign an application in the form prescribed by the superintendent. No hospital may care for more than five voluntary patients at one time, nor may voluntary patients be admitted when the quota for the county is full.

(d) *Appeal from Commitment*.—All persons confined as insane are entitled to the benefit of the writ of habeas corpus, and the question of insanity must be decided at the hearing. If the judge finds the person

insane, the decision is no bar to the issuing of the writ a second time if it is alleged that the person has been restored to reason.

(e) *Cost of Commitment.*—All expenses connected with inquests of insanity, making records, conveying patients, etc., are a charge upon the county from which the patient was committed.

**4. Conveying Patients to the Hospital.**—It is the duty of the sheriff to convey patients to the hospitals upon the order of the probate judge. If the insane person is a female, a suitable female assistant must be appointed to accompany the sheriff and the insane person to the hospital.

**5. Transfer of Patients.**—If a hospital cannot accommodate the patients of the district to which it is attached, or if the interests of a patient make a transfer advisable, the board of administration may, with the consent of the superintendents interested, order the transfer of patients to the hospital of either of the other districts which at the time has room for such patients. Transfers made at the request of relatives or friends are at their expense, but all other transfers are at the expense of the hospital from which made.

Upon the request of the probate judge of any county the board of administration may authorize the commitment of an insane person to a hospital located in another hospital district, if the reasons set forth in the application warrant such action.

**6. Parole and Discharge of Patients.**—When the superintendent deems it for the best interest of a patient who has no homicidal or suicidal propensities, he may permit him to leave the institution on a trial visit for not more than ninety days. The patient may be returned at any time within this period without further legal proceedings.

With the consent and advice of the board of administration, the superintendent may discharge any patient from the state hospital when he deems it proper and necessary, except patients of homicidal or suicidal tendencies. If the condition of the patient justifies it, he may be permitted to leave the institution unattended.

In case the patient requires an escort the superintendent must notify the probate court of the county of which the patient is an inhabitant, who must issue a warrant to a suitable person, giving the friends of patients the preference for the removal of the patient to his home.

When a patient is discharged as cured the superintendent must furnish him with suitable clothing and a sufficient sum of money, not exceeding \$20 for traveling expenses.

If the friends of a patient ask his discharge the hospital superintendent may require a bond, conditioned for the safekeeping of the patient. No patient charged with or convicted of homicide may be discharged without the consent of the superintendent and board of administration.

**7. Cost of Maintenance.**—The probate judge committing any person to a hospital for the insane must certify to the superintendent the name and address of the guardian if any is appointed and of relatives

who are liable for the person's support. The maximum rate for the support of inmates is \$3.50 a week.

A husband is liable for the support of a wife, a wife for a husband, parents for their children, and children for their parents.

Superintendents of hospitals must submit to the board of state charities the information they may obtain in regard to the financial condition of any inmate or of relatives liable for his support.

If the estate of any inmate is sufficient for his support without hardship to any dependents, and no guardian has been appointed, the agent of the board of state charities must petition the probate court to appoint a guardian.

In cases of failure of relatives or guardian to pay for the support of patients, the institution may pay such expenses and certify the account for collection to the auditor of the county from which the patient came.

**8. Criminal Insane.**—To the hospital for the dangerous and criminal insane are committed: persons who became insane while in the state reformatory or the penitentiary; dangerous insane persons in other state hospitals; persons accused of crime but not indicted because of insanity; persons indicted but found to be insane; persons acquitted because of insanity; persons adjudged to be insane who were previously convicted of crime.

When in an inquest of lunacy a probate judge finds a person insane who has previously been convicted of arson, assault, rape, robbery, burglary, homicide, or attempt to commit such acts, he must commit him to the Lima State Hospital (for the dangerous and criminal insane).

When the physician of the penitentiary or reformatory reports in writing to the warden that a convict is insane, the warden must apply to the probate court of the county in which the institution is located for an examination of the convict by two physicians of at least three years' practice in the state who are not connected with the penitentiary or reformatory. If satisfied that the convict is insane, the physicians must certify this in the form and manner provided for the commitment of insane persons to state hospitals. Convicts thus adjudged insane must be transferred to the Lima State Hospital. An insane convict under indeterminate sentence, who is transferred to the Lima State Hospital, must be detained for the maximum term of sentence provided by law for the offense for which he is convicted, unless sooner restored to reason. When restored to reason, and the superintendent of the hospital so certifies, a convict whose term of sentence has not expired must be transferred to the penitentiary or reformatory from which he came.

If the insanity of a convict in a hospital continues at the expiration of his sentence, the superintendent must apply to the probate judge of the county within five days after the expiration of the sentence for an order to retain the convict until he is restored to reason and notify friends or relatives of the application. The probate judge must notify the alleged insane person and call two physicians not



related by blood or marriage to him, who have been in actual practice of their profession for at least three years. If the judge finds satisfactory proof of insanity has been adduced, he must order the retention of the convict until restored to soundness of mind. The form of commitment is substantially that required for the commitment of inmates to other hospitals.

The superintendent may discharge patients not under sentence for crime who are recovered or who are not recovered, but whose condition is so far improved that their discharge will not be detrimental to the public welfare or to themselves.

## OKLAHOMA

### Authorities:

Constitution of Oklahoma  
Revised Laws of Oklahoma, 1910  
Supplement of 1915  
Laws of 1917

1. **Administration and Supervision.**—(a) *General.*—A commissioner of charities and corrections is elected in the same manner and for the same term as the governor. This officer may be of either sex, must be at least twenty-five years of age, and in all other respects have the qualifications required of the governor. His salary is \$2500. He must investigate the condition and management of all charitable and correctional institutions supported wholly or in part by the state or by any county or municipality. The officers of such institutions are obliged to furnish all information demanded by the commissioner. The commissioner reports annually to the governor and the legislature.

A state lunacy commission, consisting of the state commissioner of health, the chairman of the state board of public affairs, and the superintendents of the three state hospitals, is charged with the general supervision of the policy to be pursued by each hospital and with the formulation and adoption of a permanent plan and system for proper care and treatment of the insane.

The state hospitals for the insane are under the management of the state board of public affairs, consisting of three members, not more than two of whom may belong to the same political party, appointed by the governor with the consent of the senate for a period coterminous with his term of office.

The board has the general direction of the affairs of the hospitals, appoints the medical superintendents, assistants, and physicians, and establishes by-laws, rules, and regulations for the institutions.

The board must meet at the different hospitals at least twice each year, and at such other times as are prescribed by the by-laws. The superintendents and the state commissioner of health must meet with the board. A committee must visit and inspect each institution once every three months, and the entire board must visit and inspect the institutions at least once a year. Biennial reports of the results of the inspections must be made to the governor. They must be accompanied by the reports of the superintendents.

The county commissioners have supervision of the insane who are committed or admitted to the county poorhouses and jails.

(b) *Institutional*.—The superintendent is the chief executive officer of each institution. He must be a legally registered physician, experienced in the care of the insane. He appoints his assistants and attendants, with the approval of the board of public affairs, and may suspend officers until the next meeting of the board. He must personally examine each patient after admission, and visit all wards.

2. **Care**.—(a) *In State Institutions*.—Central Oklahoma Hospital for the Insane, Norman; established, 1895; beds, 1000.

Western Oklahoma State Hospital for the Insane, Supply; established, 1902; beds, 700.

Eastern Oklahoma Hospital for the Insane, Vinita; established, 1913; beds, 650.

(b) *In Local Institutions*.—Insane persons who cannot be received at the state hospitals or who for other reasons are not sent there, may be cared for in county poorhouses or jails under the supervision of the county commissioners.

3. **Commitment**.—(a) *Persons Committed*.—Patients are divided into three classes, public, private, and voluntary. No person who is a resident of the state may be held as a patient in any hospital except upon a certificate of insanity and an order of admission. Non-residents may be admitted as private patients. The board of public affairs, the medical superintendents, and the state commissioner of health may divide the state into districts. Patients may be sent to the hospital of the district in which they reside.

(b) *Legal Procedure in Commitment*.—Patients are not admitted except upon certificates of insanity and orders of admission. The certificates must be made by two reputable, registered, graduate physicians.

Application for an order of admission may be made to the county court or the judge by the father, mother, husband, wife, brother, sister, or child of the person alleged to be insane, or by the sheriff, superintendent of the poor, supervisor of any township or any peace officer.

The court must fix a day for the hearing, and appoint two reputable physicians to examine the person. Notice must be served personally upon the person and the relatives or persons with whom he resides at least twenty-four hours before the hearing. Personal service may be dispensed with upon the order of the court, in which case a guardian *ad litem* is appointed by the court. If a jury is not demanded, the court may determine the sanity or insanity of the person. If demanded or if deemed necessary a jury of six freeholders must be summoned by the court.

If found to be insane, the court must issue an order for admission as a public or a private patient. No person may be admitted under any order after the expiration of thirty days from its date. Notice of the order of admission of a public patient must be given by the judge to the prosecuting attorney.

If two qualified physicians certify that it is necessary, patients may be temporarily detained in the hospital, pending commitment, for not over thirty days, unless the time is extended by the court.

When patients cannot at once be admitted to a state hospital and cannot with safety be allowed to go at liberty, the county commissioners must require them to be suitably provided for otherwise until admission can be had, or until the occasion therefor no longer exists. Such patients are considered as private patients when relatives or friends obligate themselves to take care and provide for them without public charge. In this case the commissioners must appoint some suitable person a special custodian, with authority and the duty to restrain, protect, and care for the patient. In the case of public patients, the commissioners must require them to be restrained, protected, and cared for by the commissioners of the county or overseers of the poor, at the expense of the county. If there is no poorhouse for their reception, or if no more suitable place can be found, they may be confined in the county jail in charge of the sheriff. Or the commissioners may require that such patients be taken to a hospital in any state designated by the governor, who is authorized and empowered to make the best terms he can with the authorities of any state for the admission of such patients.

On application to the county commissioners on behalf of persons alleged to be insane and whose admission to a state hospital is not sought, asking that provision be made for their care as insane, either public or private, within the county, and on proof of their insanity and need of care, the commissioners may provide for them as in the case of other applications. On information that an insane person in the county is suffering for want of proper care, the commissioners must at once inquire into the matter and make all needful provision for his care.

(c) *Voluntary Admission.*—After providing ample accommodations for all public and private patients entitled to admission, the superintendent may receive and detain as a boarder and patient any resident of the state who applies for admission, if his mental condition is such as to render him competent to apply for admission, provided the approval of the judge of the county in which the person resides is obtained. A voluntary patient may not be detained for more than three days after having given notice in writing of his intention or desire to leave. Persons afflicted with serious nervous disorders who are not insane may be admitted in a similar manner, if in addition a certificate of two reputable physicians is presented.

(d) *Appeal from Commitment.*—On a statement verified by affidavit addressed to the county judge of the county in which the hospital is situated, or of the county in which a person confined in the hospital has his legal settlement, alleging that he is not insane, the judge must appoint a commission of not more than three persons to inquire into the case, one of whom must be a physician, and if two or more are appointed, one must be an attorney. They must have an interview with the person alleged not to be insane and report to the county judge.



Their report must be accompanied by a statement of the case and be signed by the superintendent. If the county judge finds the person not insane, he must order his discharge; if not, he must authorize his continued detention. The commission may not be repeated oftener than once in six months for the same patient, nor may a commission be appointed in the case of any patient within six months of the time of his admission.

(e) *Cost of Commitment.*—The expenses attending the commitment of an insane person, including the compensation to officials, are paid out of the county treasury, but the allowance to the sheriff and his expenses are a charge upon the state treasury.

4. **Conveying Patients to the Hospital.**—The sheriff of the county may execute the warrant of the court directing the transportation of a patient to the hospital, or the court or judge may appoint some other suitable person to execute it. No female patient may be taken to the hospital without the attendance of some other female, or some relative. If any relative or intimate friend of the patient, who is suitable, requests it, he has the privilege of executing the warrant, in preference to the sheriff or any other person.

5. **Transfer of Patients.**—The superintendent of any state eleemosynary institution may certify to the county court the name of any inmate who is in his opinion insane. The court must cause the inmate to be examined by two reputable physicians and hear witnesses. If adjudged insane the court may issue an order for the commitment of the inmate as a public patient. Upon restoration the inmate must be returned to the institution from which he was transferred.

Patients may be transferred to the state hospital upon the order of the governor, after certification by the board of public affairs.

Expenses of all transfers are paid out of the general fund upon the certification by the board of public affairs.

6. **Parole and Discharge of Patients.**—The superintendent may discharge recovered patients. Those who are not recovered may be discharged if a notice is sent to the friends of the patient or to the proper county officer; if the patient is not removed within ten days, he must be returned to his home, friends, relatives, or to the county officer. If the superintendent refuses to discharge a patient upon request, the matter is determined by the court. A discharged patient may be readmitted under the original order within six months, but thereafter, he may be readmitted only upon a new adjudication of insanity and a new order of admission.

No patient may be discharged without suitable clothing. Upon the order of the superintendent, clothing and money not exceeding \$25 must be furnished to each discharged patient.

All persons confined as insane are entitled to the benefit of the writ of habeas corpus, and the question of insanity must be decided at a hearing. The medical history from the books of the hospital must be given in evidence and the superintendent or officer in charge of the institution may testify as to the mental condition of the person. If the

judge or court decides that the person is insane this decision is no bar to the issuance of the writ a second time, whenever it is alleged that he has been restored to reason.

The superintendent may grant a parole to a private patient not exceeding thirty days at any one time. The parole does not affect the validity of the charge for the support of the patient.

**7. Cost of Maintenance.**—If a bond for support is given at the time of admission, the patient is admitted as a private patient. If the bond is not supplied at the time of admission, the patient is admitted as a public patient, but the county is liable for the support of the patient for one year. If no bond is then supplied the patient becomes a public patient.

The state pays the expenses of maintaining all public patients. The estate or relatives of any public patient are liable to the state for all expenses incurred. The county attorney represents the state in all proceedings to reimburse it for expense of maintaining public patients.

Relatives who are able may be ordered to pay reasonable sums not exceeding \$200 a year for the support of inmates. Orders for payment may be vacated by the court.

Private patients may be declared public patients, and public patients may be declared private patients upon the order of the court.

The rate of charge per week to be paid for the treatment of all patients is fixed annually by the joint boards, and may not exceed the actual cost, including officers' salaries. Extra attendance may be furnished by special contract.

The rate of charge for voluntary patients is the same as for public and private patients. Indigent voluntary patients may be supported by the state upon approval by the board of public affairs.

**8. Criminal Insane.**—If doubt arises as to the sanity of the defendant in a criminal procedure a jury must be summoned to try the question. If found insane the defendant is committed to the care of the sheriff until he becomes sane. The expense is paid by the county, but may be collected from the estate of the defendant or from a relative.

Insane convicts must be cared for in the hospital and returned to the penitentiary upon recovery, unless their terms of sentence have expired.

## OREGON

### Authorities:

Lord's Oregon Laws, 1910  
Laws of 1913, 1917

**1. Administration and Supervision.**—(a) *General.*—The state board of control, consisting of the governor, secretary of state, and state treasurer, has general power of direction and supervision over all state institutions including the hospitals for the insane. It makes by-laws, suspends or discharges executives and subordinates, fixes such salaries as are not fixed by law, prescribes duties for executive heads where they are not prescribed by law and additional duties deemed for the good of the public service.

Meetings of the board are open to the public, and their records always open to inspection. The board must visit the state hospital at Salem every three months, and the hospital at Pendleton once a year, and report biennially to the legislature. The report must be mailed to each member of the incoming assembly at least thirty days before it convenes.

The board appoints a salaried secretary, who visits the institutions at stated intervals or when directed by the board, and among other duties serves as purchasing agent.

(b) *Institutional*.—There are no local boards of trustees. The board appoints a superintendent for each hospital (salary \$3000 per annum). He appoints his assistants; he prescribes treatment and discipline subject to the rules of the board. It is provided that the institution at Salem shall have three assistants, the institution at Pendleton two, but the board may authorize the employment of other necessary physicians. The superintendent may also appoint other officers and employees subject to the approval of the board. He may suspend or remove subordinates subject to the approval of the board.

2. **Care**.—(a) *In State Institutions*.—Oregon State Hospital, Salem; established 1883; 1684 beds.

Eastern Oregon State Hospital, Pendleton; established 1913; 600 beds.

(b) *In Local Institutions*.—The indigent insane who cannot be admitted to or kept at the state hospitals are under the supervision of the county courts, which have the exclusive superintendence of the poor in their respective counties, and which may provide for them in almshouses.

3. **Commitment**.—(a) *Persons Committed*.—All insane persons, residents of the state, are entitled to admission to a state hospital.

(b) *Legal Procedure in Commitment*.—The county judge of any county in the state, upon application of any citizen in writing, stating that any person by reason of insanity is suffering from neglect, or is unsafe to be at large, must cause such person to be brought before him for a hearing, summoning at the same time one or more competent physicians to examine the person alleged to be insane. If the physician or physicians, after careful examination, certify under oath that the person is insane, the judge upon approving their findings, must provide for the safekeeping of the person and cause him to be conveyed to a state hospital. When a person is adjudged insane the county judge must make a warrant reciting his findings, the name, age, nativity, and present residence of the patient, and a copy of the physicians' certificate. The warrant is recorded in the findings of the court, and a copy sent with the patient to the superintendent of the hospital and another to the secretary of state.

(c) *Voluntary Admission*.

(d) *Appeal from Commitment*.—An appeal lies from the county court in insanity cases and in the same manner as provided for appeals from the county court in other cases.



(e) *Cost of Commitment.*—The cost of examination and committal is to be paid by the county in which the examination was made; but the cost of transporting patients to the hospital is borne by the state.

4. **Conveying Patients to the Hospital.**—The person committed, together with the warrant of the judge and certificate of the physician, must be delivered to the sheriff of the county, and by him to the agent appointed by the superintendent to convey the insane person to the hospital.

5. **Transfer of Patients.**—The board may transfer patients from one hospital to the other in order to improve their condition or lessen their cost of maintenance. Transfers may be made by the board from the penal institutions if upon examination the inmates are found to be insane.

6. **Parole and Discharge of Patients.**—The superintendent shall discharge such patients as are in his opinion properly fit to be discharged.

7. **Cost of Maintenance.**—Indigent insane are cared for at the hospital at the expense of the state.

8. **Criminal Insane.**—A person acquitted of a criminal charge on the ground of insanity, if deemed by the court dangerous, must be committed to any insane hospital to remain until he becomes sane or is otherwise discharged by authority of law.

When any convict confined in the state penitentiary is in the opinion of the warden or prison physician insane, notice must be given to the clerk of the board, which then orders an examination by one or more of the physicians of the state hospital. If they report the convict insane the board must order him transferred to the state hospital for treatment; but the board may at any time cause him to be transferred back to the state penitentiary.

## PENNSYLVANIA

### Authorities:

Pepper and Lewis' Digest of the Laws of Pennsylvania, 1907  
Laws of Pennsylvania, 1911, 1913, 1915, 1917

1. **Administration and Supervision.** — (a) *General.* — The general supervision over all hospitals and institutions for the care and treatment of the insane is entrusted to the board of public charities through its committee on lunacy. This committee consists of five members who are appointed by the governor for terms of five years, and one of them must be a member of the bar of at least ten years' standing, and one a practising physician of at least ten years' standing. The committee on lunacy must examine personally or through its secretary and report annually to the whole board the condition of the insane in the state, and the management of hospitals, public and private almshouses, and all other places where insane are cared for and treated.

The committee, with the consent of the chief justice of the supreme court and the attorney general, has authority to license all places in which insane persons are cared for, except prisons and state hospitals. It is a misdemeanor to conduct an institution for the

insane without a license, or when a license has been suspended. The committee makes all regulations for the proper treatment of insane, for the commitment of the insane, and the forms to be observed in regard to the commitment and transfer of custody and discharge of patients other than those committed by the order of a court of record. It furthermore regulates the number of persons that may be detained, the accommodations to be provided, and all other things pertaining to the management and control of institutions for the care or detention of the insane. The board and the committee on lunacy make annual reports.

For each county in which there is a hospital or place where insane persons are kept a board of visitors, consisting of not less than three persons, must be appointed by the board of public charities.

(b) *Institutional*.—The state hospitals are under the direction and control of boards of trustees or managers that vary somewhat in composition, but generally consist of nine members, appointed by the governor for terms of three years. The boards have general control of the affairs of the hospitals and appoint the superintendents, who must be skilful physicians and are subject to removal or re-election not oftener than once in three years, except for breach of trust. The superintendents appoint and control all subordinate officers, subject to the approval of the trustees.

2. **Care**.—(a) *In State Institutions*.—Pennsylvania State Lunatic Hospital, Harrisburg; established 1845; 1000 beds.

State Hospital for the Insane, Danville; established 1872; 1450 beds.

State Hospital for the Insane, Warren; established 1873; 1282 beds.

State Hospital for the Insane, Norristown; established 1879; 3200 beds.

State Asylum for the Chronic Insane of Pennsylvania, Wernersville; established 1891; 875 beds.

Homeopathic State Hospital, Allentown; established 1901; 1000 beds.

State Hospital for the Criminal Insane, Waymart; established 1905; 150 beds.

Western State Hospital for the Insane, Westmoreland County; authorized 1915.

Eastern State Hospital for the Insane; authorized 1917.

(b) *In Local Institutions*.—Several counties and cities maintain their own institutions for the insane in connection with the county homes or as separate hospitals under the supervision of the directors of the poor of the county or the municipal authorities, as the case may be. The Philadelphia General Hospital has a psychopathic ward of 175 beds.

Hospitals maintaining medical and surgical staffs, and in which courses of lectures in mental diseases are open to medical students may, with the consent of the board of public charities, maintain

psychopathic wards for the reception and treatment of persons suffering with mental disorders.

Provision is made for the employment of the insane confined in institutions, wholly or in part maintained by the state, and for the distribution of the supplies, manufactured articles, goods, and products made in any state institution for the care of the insane, feeble-minded, and epileptic.

The trustees of the insane or district overseers of the poor may provide a building, or a room in a building separate from the insane department of the district, for the care, treatment, and maintenance of persons committed to their care who are temporarily mentally deranged.

**3. Commitment.**—(a) *Persons Committed.*—All insane persons are entitled to admission to the state hospitals for the insane or to county or city asylums where such are maintained. Pay patients may be received, but indigent insane shall have preference.

(b) *Legal Procedure in Commitment.*—On statement in writing to a judge in the common pleas or quarter sessions of any respectable person that a person is insane, and that the welfare of himself or of others requires his restraint, the court must immediately appoint a commission to inquire into the facts of the case. This commission must be composed of three persons, one of whom at least shall be a physician and another a lawyer. They hear evidence and the statements of the party complained of, or of his counsel, and if, in their opinion, it is a suitable case for confinement the judge must issue his warrant for such disposition of the insane person as will secure the object of the measure.

When a person is found by inquisition to be insane, the committee of the person or of the estate, and also the clerk of the court in which the inquisition has been returned, must send to the committee on lunacy a statement signed by the committee of the lunatic, giving his name, age, sex, and residence. The committee on lunacy may visit and examine the lunatic, and is authorized to apply to any court having jurisdiction over the committee, or to a judge of a court of common pleas of the county in which the lunatic is a resident or detained, to make such orders for his maintenance and for the care and disposition of his property as the case may require.

If it is made to appear to any law judge that an insane person is suffering from the want of proper care or treatment, he must order him placed in some hospital for the insane, at the expense of those who are legally bound to maintain him, but no such order may be made without due notice to the persons to be affected thereby, and the hearing had thereon.

No person may be received as a patient in any institution for the insane without a certificate signed by at least two resident physicians who have been in actual practice for at least five years, both of whom must certify that they have examined separately the person alleged to be insane, and that he requires care and treatment in a hospital



or other establishment for the insane. The certificate, duly attested under oath, before a judge of the county certifying to the standing and good repute of the signers, must have been made within a week of the examination of the patient, and within two weeks of the time of the admission of the patient. No person alleged to be insane may be received into any house for treatment or detention unless at the time of his reception the person or persons at whose instance commitment is made states in writing that in their belief the detention is necessary and for the benefit of the insane person.

The law prescribes in detail the facts concerning insane persons which must be made known at the time of admission to the superintendent who receives him. Within twenty-four hours after the reception of a person in any hospital, these facts must be entered in a book kept for that purpose. The regular medical attendant must then examine the patient and reduce the results of the examination to writing.

The medical attendants of hospitals are required to report to the committee on lunacy, within seven days from the time of the reception of the patient, the statements given at the time of the reception of the patient, and the results of the examination. At least once in six months a report must be made on the condition of every patient.

The managers and officers of a hospital for the insane are not liable to the penalties imposed by the law in case of receiving for detention an insane person without complying with the legal requirements, if the judge trying the cause certifies that the officers and managers had good reason to believe that the reception and detention were necessary for the safety of the insane person. But the person must be legally committed or discharged from custody within forty-eight hours, and the board of public charities must have been notified of the facts connected with the reception and detention.

Persons suffering from mental disorders may be committed for not more than thirty days to the psychopathic wards of hospitals for observation and treatment in the same manner as persons are committed to hospitals for the insane. The courts before whom persons charged with offenses are brought for examination or trial may in like manner commit them to psychopathic wards for observation and diagnosis. But persons admitted to these wards who are found insane must be regularly committed and removed to a hospital for the insane within thirty days.

Whenever a person has become insane or so mentally defective that he is unable to take care of his property, the immediate relatives, creditors, or in their absence, any other person, may present to the court of common pleas of the county in which the person resides a petition under oath, asking the court to adjudge such person to be unable to take care of his property and to appoint a guardian for the estate of such person. The hearing of the petition must be in the presence of the person against whom it is presented, unless it is unsafe to require his presence. If the court is satisfied that the person

is not able, owing to insanity or weakness of mind, to take care of his property, he must enter a decree accordingly, and appoint a guardian to take care of it. Upon written request, a trial of the case may be had by jury. When a decree has been issued, a guardian must be appointed with the same powers as the committee on lunacy.

(c) *Voluntary Admission*.—Persons who are threatened with mental disorders and voluntarily place themselves in institutions for the insane may be received for a period of one month or less by an agreement which must specify the time, and be signed by them at the time of their admission. At the end of one month they may renew the agreement, but no agreement is valid unless signed in the presence of some adult person attending as a friend of the applicant, and by the medical attendant.

(d) *Appeal from Commitment*.—On a sworn statement addressed by some respectable person to any law judge, that a person confined in a hospital for the insane is not insane and unjustly deprived of his liberty, the judge must issue a writ of habeas corpus, and hold a public hearing on the question. The onus of proving the person insane rests upon those restraining him of his liberty. From an order by a court regarding the care of an insane person and the disposition of his estate, an appeal may be taken to the supreme court.

(e) *Cost of Commitment*.—If a person is found to be not suitable for commitment as insane and the proper court or a law judge so affirms, the one petitioning for his commitment is liable for all costs. If he is found suitable for commitment and has sufficient property, the property is liable to all costs. If the person is found insane and suitable for commitment and has not sufficient property, the county liable for his support in the hospital is also liable for all costs.

4. **Conveying Patients to the Hospital**.—When an indigent female insane patient is to be removed from one place or institution to another, or returned from an institution, the court under whose order she is committed, or the commissioners of the county or the overseers of the poor of the district must provide a female attendant for every female patient in transit, unless the patient is accompanied by a member of her family. Refusal to comply with this provision or neglect to do so is subject to a penalty of \$250.

5. **Transfer of Patients**.—The committee on lunacy is authorized, when satisfied that any of the state hospitals for the insane are overcrowded, to transfer patients from one state hospital to another and the liability of the municipalities, poor district, or persons, for the support of the patient is continued. The cost is paid from the general appropriation for the insane.

6. **Parole and Discharge of Patients**.—In case the medical attendant of a hospital is of opinion that detention is not necessary for the benefit of the patient, he must [notify those at whose instance the patient is detained, and unless satisfactory proof to the contrary is forthcoming within seven days, the patient must be discharged.

All persons detained as insane other than the criminal insane must be discharged as soon as they are restored to reason and competent to act for themselves. The committee on lunacy must be notified of all discharges within seven days after they have been made, and may at any time order the discharge of any person detained as insane other than criminals, but not without due notice to the person in charge of the institution where the patient is kept and to the persons at whose expense the patient is detained. The committee may not sign an order of discharge unless they have personally attended and examined the case of the patient.

On statement in writing to any law judge by some friend of a person placed in a hospital that he is losing his bodily health, and that his welfare would be promoted by his discharge, or that his mental disorder has so far changed its character as to render further confinement unnecessary, the judge must make suitable inquisition and may or may not order the discharge of the person.

Persons placed in any hospital for the insane may be removed by those who have become responsible for the payment of their expenses; provided that such obligation was the result of their own free act, and that its terms require the removal of the patient in order to avoid further responsibility.

Whenever any indigent insane inmate of a hospital is discharged, the authorities of the hospital must pay the traveling expenses of the inmate to his home.

**7. Cost of Maintenance.**—The expense of the care and treatment of the indigent insane in the state hospitals for the insane is fixed at \$2.50 per week for each person. The amount includes the cost of clothing. It is charged to the counties or to the poor districts from which the person was committed. The excess, which may not exceed \$2.50 per week, is paid by the state. The cost of maintaining persons in the hospital for the chronic insane may not exceed \$4 per week. Two dollars of the amount must be paid by the counties or by the poor districts and the remainder by the state.

Any county, subdivision thereof, or city maintaining a suitable institution for the insane is entitled to receive from the state the sum of \$2 per week for each indigent insane person committed to the institution or transferred to it from a state hospital.

The county from which he was sent is liable for the support of an insane person who has been committed to it by any court.

Hospitals maintaining psychopathic wards are entitled to receive from the state \$2 per day for each indigent person received during the time of his stay.

The husband, wife, father, mother, or child of a patient in any asylum or hospital maintained in whole or part by the state, if able to pay, is liable for the maintenance of the patient. The value of a patient's estate must be reported to the attorney-general yearly in order that proper charges may be made against it.

**8. Criminal Insane.**—When a person is acquitted in a criminal suit



on the ground of insanity, the court must order the prisoner to be committed to some place of confinement for safekeeping or treatment.

The person may, however, be released from custody on parole by the court in which he was acquitted. The court directing the release on parole on the grounds of insanity may prescribe such terms and conditions of release as to it may seem proper.

If, after a confinement of three months' duration, any law judge is satisfied by the evidence presented to him that the prisoner has recovered, and that the paroxysm of insanity in which the criminal act was committed was the first and only one he had ever experienced, he may order his unconditional discharge. If it appears that the paroxysm of insanity was preceded by at least one other, the court may appoint a guardian of his person under bond for any damage his ward may commit. In case of homicide or attempted homicide, the prisoner may not be discharged, unless in the opinion of the superintendent and three-fourths of the managers of the hospital and the court before which he was tried he has recovered and is safe to be at large.

Insane convicts may not be received at any hospital except when delivered by the sheriff on order of the court of the county in which they were arrested or committed, nor may such convicts be discharged from a hospital except upon an order to the sheriff or his deputy by the court. If any person detained in any prison is insane or in such condition as to require treatment in a hospital for insane, any law court under whose order the person is detained must upon application make an inquiry into the circumstances, either by a commission or otherwise, with notice to the committee on lunacy, and if the judge is satisfied that the person requires hospital treatment, he must direct his removal to a state hospital, the cost to be borne by the county liable for his maintenance in prison.

The discharge of an insane convict confined in any hospital by order of any court or of a person who has been acquitted on trial because of insanity and likewise confined, is prohibited except by order of a court of competent jurisdiction; and in such a case, the insane person, whether a convict or acquitted, is not to be set at large, but to be removed to a place of custody other than a hospital. The order for removal may not be made without notice to the committee on lunacy, and time must be given them to investigate the case and act on the application.

Whenever any person committed to jail charged with an offense not amounting to a felony is found to be insane, he may be removed to a hospital for the insane.

The cost of commitment, removal, and maintenance of any person committed to a state hospital as an insane criminal must be paid by the county wherein the crime was committed. The county may recover the amount expended or any part thereof from the estate of the person or relatives liable for his support, but not from the poor districts.

## RHODE ISLAND

## Authorities:

General Laws of Rhode Island, 1909

Public Laws of Rhode Island, 1909-1910, 1912, 1914, 1915, 1917

1. **Administration and Supervision.**—(a) *General.*—The penal and charitable commission consists of nine persons. Three of the members are appointed from the county of Providence, one from each of the other counties, and two from the state at large. They are appointed for terms of six years and serve without compensation, but receive their traveling expenses. The governor may remove or suspend any member.

The commission has full management and control of the state penal and charitable institutions, including the hospital for mental diseases. Meetings must be held at least once every month and at such other times as may be determined. Annual reports must be made to the assembly. The commission appoints the officers for the institutions and determines their salaries.

(b) *Institutional.*—There are no local boards of trustees.

2. **Care.**—(a) *In State Institutions.*—State Hospital for Mental Diseases, Howard; established 1869; 1400 beds.

The state also contributes to the support of patients in the Butler Hospital, Providence, which is an incorporated institution under private management.

(b) *In Local Institutions.*—Insane persons may be provided for in town asylums, but not unless, in the opinion of the secretary of the penal and charitable commission, they are properly cared for.

(c) *In Families.*—The penal and charitable commission may place any chronic, quiet patient in board with any suitable family at a cost not exceeding maintenance in the state hospital.

3. **Commitment.**—(a) *Persons Committed.*—All insane persons who are residents of the state are entitled to be cared for at the state hospital, or may be supported in part at the Butler Hospital by the state.

Parents, guardians, relatives, or friends may place insane persons in a hospital for the insane; provided, they present to the superintendent a certificate of insanity from two physicians of good standing. The state is not liable for the support of such patients.

(b) *Legal Procedure in Commitment.*—Upon the written application of the parent, guardian, relative, or friend of an insane person, accompanied by the certificates of two practising physicians registered in the state that such person is insane, the penal and charitable commission is authorized to receive him for care and treatment upon such terms as it may fix.

Upon sworn complaint to any justice or clerk of a district court that a person within the county is so insane as to be dangerous to the peace and safety of the public, the justice or clerk must issue a warrant for the person and have him brought before the district court for examination. When the complaint is accompanied by a certificate signed by two practising physicians in the state declaring that the alleged insane person cannot without serious consequences be examined in

open court, district courts are empowered to hold examinations at times and places most conducive to the health and comfort of the person examined. When an examination is made at any other place than in open court, the justice may not commit the person to a hospital without having the testimony of two practising physicians of good standing that the person is insane and in need of restraint. If the court holds the complaint to be true it must, unless some other provision for the adequate restraint and treatment of the person satisfactory to the court is made, commit him to the Butler Hospital or to the state hospital for mental diseases.

On a sworn petition setting forth that any person is insane and should be placed in the hospital for mental diseases, any justice of the supreme court may call in not less than three commissioners to make inquiry and report whether the person in question is insane or not; and if insane, he must be placed in a hospital, either for cure or for restraint. The commissioners must give notice to the person complained of as insane, of the time and place of hearing, so that by his own statements or by counsel he may defend himself. The commissioners may issue summons and compel the attendance of witnesses. When the person alleged to be insane is unable to obtain counsel and summon witnesses, the court or commission must appoint a competent counsel and summon all necessary witnesses. The justice may issue a warrant for the apprehension of the person complained of and order him detained by the officer to whom the warrant is directed or to be committed to the Butler Hospital or the state hospital for mental diseases, or other public place for detention, pending the inquisition. Upon the report of the commissioners the justice may, without further hearing, order the person complained of to be confined in the Butler Hospital or the state hospital, or in some other curative hospital for the insane, or he may dismiss the petition. Insane persons may be placed in the Butler Hospital or other curative hospital for the insane, supervised by officers appointed under the authority of the state, by their parents or guardians, or by their relatives or friends, but the superintendent of the hospital may not admit any person without a certificate from two practising physicians of good standing, stating that the person is insane.

Any physician who unlawfully commits to any hospital for the insane a person who is not insane is liable to a fine not exceeding \$500 or imprisonment not exceeding five days.

(c) *Voluntary Admission*.—The superintendent of any hospital for the insane may receive as a boarder and patient any person who is desirous of submitting himself to treatment, and who makes a written application, but whose mental condition is not such as to render it legal to grant him a certificate of insanity. Such a boarder may not be detained for more than three days after having given notice to the superintendent of the hospital that he desires to leave it.

(d) *Appeal from Commitment*.—On petition of any person confined in an institution for the insane, or of any person on his behalf, to a



justice of the supreme court, stating that he has reason to believe that such person is not insane, the justice must issue a commission for the purpose of inquiring into the condition of the person. The personal examination by the commissioners of the person detained as insane must take place in the institution where he is detained, except by order of the justice issuing the commission. In other respects the commission has the same power, and proceeds in the same manner as provided in case of examination for the commitment of the insane. The right of any person to the writ of habeas corpus is not abridged; and upon application for it, the court must inquire into and determine the sanity or insanity, or the necessity for restraint, of the person confined. If it appears necessary to the court, the case must be submitted to a jury in the superior court.

No commission may be issued until the applicant pays or secures all costs and expenses connected therewith, as well as the expense of any ensuing confinement. No payment or security is required in case the application is for the discharge of the person confined by himself. In such a case, all costs are charged against the estate of the applicant or person committing him to the hospital, or in case of poor and indigent persons, against the state.

(e) *Cost of commitment.*—The costs of the commitment of an insane person are to be paid by him if he has any estate; otherwise by the state, until the liability of some town for his maintenance has been established. When the person or town chargeable with the cost neglects to pay it, the secretary of the penal and charitable commission must give notice to the attorney-general, who must begin action for the recovery of the costs.

4. **Conveying Patients to the Hospital.**—A female patient must be accompanied to the hospital by a woman assigned by the court in addition to the committing officer, unless accompanied by a relative.

5. **Transfer of Patients.** 6. **Parole and Discharge of Patients.**—The superintendents of the state hospital for mental diseases and of the Butler Hospital, acting under the direction of the penal and charitable commission, may, whenever they shall deem it for the welfare of any inmate and consistent with public safety, permit an inmate to leave temporarily, in charge of his guardian, relatives, or friends, for a period not exceeding six months, to be received whenever returned by the guardian, relatives, or friends within this period, without further order of commitment.

Patients committed to hospitals for the insane by order of court may be discharged, although not restored to sanity, upon the written recommendation of the trustees and superintendent of the hospital by an order of any justice of the supreme court. The superintendent of any institution for the insane may, on the application of any relative or friend and upon the approval of the trustees, discharge any patient not committed by a process of law.

Persons who have placed an insane person in a hospital for the

insane and voluntarily become responsible for the payment of his expenses while in the institution, have the right to remove him.

The secretary of the penal and charitable commission, together with the chairman of the state board of health, constitute a commission to receive all complaints, and communications from, or relating to, any inmate of any hospital for the insane within the state. Whenever it seems to them advisable, they must make inquiry and petition any justice of the supreme court for an examination into the condition of an insane person, and the justice may, in his discretion, cause the person to be discharged. The commission must present forthwith to some justice of the supreme court any application of any person confined for the appointment of a commission of examiners. The commission must from time to time visit every institution or place where any insane person is confined and examine into his condition. Upon proper complaint of improper treatment of any insane person in any institution, the commission may take the complaint before any court having jurisdiction, and prosecute it.

Whenever the secretary of the penal and charitable commission complains in writing to any justice of the supreme court that any person alleged to be idiotic or insane is not properly cared for, or is improperly confined or restrained of his liberty in any town, the court must investigate the complaint, and if it be found true, order him removed to the state hospital for mental diseases.

**7. Cost of Maintenance.**—Whenever an insane pauper chargeable to any town or city is admitted to the state hospital for mental diseases or the Butler Hospital or any other hospital, the entire cost is paid by the state.

The governor is authorized to draw upon the state treasury for the maintenance in whole or in part of indigent insane persons, inhabitants of the state, whom he may select as state beneficiaries. The penal and charitable commission, through its secretary, may designate as state beneficiaries indigent insane persons, residents of the state under treatment, whom they may deem proper objects for state aid, and may draw upon the state for the cost of their support in part at the Butler or other curative hospital.

**8. Criminal Insane.**—Whenever a person tried upon an indictment sets up insanity as defense, the jury, if they acquit him, must so state; and if the person acquitted is regarded by the court as dangerous to the public peace if left at large, the court must certify this opinion to the governor, who may make provision for his maintenance and support in the prison insane ward, the state hospital for mental diseases, or other institution for the insane. On the petition of the secretary of the penal and charitable commission, or of the officer having the custody of any person awaiting trial or imprisoned in any county of the state, stating that he is insane, the presiding justice of the superior court, or in his absence any justice of the superior court, may make such an examination of the person as he shall deem proper; and if satisfied that the person is insane or idiotic, he may order his transfer

to the prison insane ward or to the state hospital for mental diseases. When restored to reason, the presiding justice of the superior court may, in his discretion, remand the person to the place of his original confinement, to await trial for the offense for which he was committed. The estate of any such insane person is liable for the maintenance.

On petition of the penal and charitable commission, stating that any convict in the state prison or in the Providence county jail, or on the petition of the clerk of the superior court for any of the other counties, that a convicted prisoner in the jail of his county is insane, idiotic, or permanently incapacitated for mental or physical labor, the presiding justice of the superior court, or in his absence any justice of the superior court, may order his examination, and transfer him to the prison insane ward, the state hospital for mental diseases, or the state infirmary. The order must be for and during the term of the prisoner's sentence.

Upon restoration to reason or to health, any person thus transferred may, by order of the presiding justice of the superior court be transferred to the place of his original confinement, to serve out the remainder of his sentence.

## SOUTH CAROLINA

### Authorities:

Code of Laws of South Carolina, 1912  
Acts of 1915, 1917

1. **Administration and Supervision.**—(a) *General.*—The board of charities and corrections has visitorial and advisory duties without administrative or executive powers. It consists of five members appointed for the term of five years. The board or its secretary inspects the hospitals for the insane at least once in six months. The board inspects the workings and results of chartered institutions or associations engaged in the care of defective children or adults, and makes reports thereon. It appoints in each county or city a local committee of three visitors.

(b) *Institutional.*—The state hospital for the insane is under the direction and control of a board of regents, consisting of five members appointed by the governor for terms of six years.

The regents establish by-laws and rules for the government of the hospital, fix the salaries of officers and attendants, not otherwise provided for by law, and establish the rates of admission, maintenance, and medical attendance for patients other than beneficiaries.

The superintendent appoints and removes all officers and employees, and makes all rules for the institution. The governor appoints a visiting board of one physician, one minister of the Gospel, and one layman, who inspect the hospital and report to the governor each month.

2. **Care.**—(a) *In State Institutions.*—State Hospital for the Insane, Columbia; established 1821; 1700 beds. There are separate departments for white and colored patients.



(b) *In Local Institutions.*—The indigent insane not admitted to the state hospital because harmless or incurable are maintained in the county poorhouses under the charge of the county commissioners, except in the cities of Charleston and Columbia where the city authorities are the overseers of the poor.

3. **Commitment.**—(a) *Persons Committed.*—The state hospital for the insane is maintained solely for the custody and treatment of insane persons. A person is considered insane or fit to be a patient in the hospital who by reason of mental aberration of a more or less permanent character is dangerous to others or to his own life or person, or to property. Lack or loss of mental ability properly to conduct his usual work or business must be considered along with aberrant conduct in determining the question of a person's insanity. Harmless imbeciles, idiots, or epileptics may not be maintained at the hospital except as pay patients.

No non-resident of the state may be admitted to a state hospital. If the resident of some other state is found to be insane the judge of probate informs the governor of the other state, and unless its authorities remove the insane person within a reasonable time the county commissioners have him conveyed to the state of his citizenship. In the case of a foreigner the governor transmits the information to the secretary of state of the United States.

Inebriates or persons addicted to the drug habit may not be received in the state hospital for the insane for treatment, unless they are dangerous or violent. The board of county commissioners of the respective counties from which such persons are sent, if beneficiaries, must pay to the state hospital for their maintenance the same sum upon the same terms required for pay patients. Any inebriate or person addicted to the drug habit, who voluntarily makes application for admission to the hospital, may, at the discretion of the board of regents, be received as a pay patient; but not when the accommodations are inadequate for insane patients.

(b) *Legal Procedure in Commitment.*—Application by a relative, friend, or citizen for commitment of an insane person to the hospital must be made to the judge of probate of the county in which the alleged insane person resides. The judge may investigate the case by examining witnesses or not as he sees fit, and if he is reasonably convinced that the application is a just one, he must transmit answers to the list of interrogatories prepared by the regents, and forward them to the superintendent of the hospital with an application for admission. If necessary the superintendent may refer the application to the board of regents before final answer.

When informed that the person can be received, on what terms and under what class, the judge of probate must call two physicians to certify to the insanity of the person. The physicians must be registered according to the law of the state, and may not be related to the patient. They must certify that he is not an epileptic, a lunatic incurable at home, and that he is violent and dangerous. If the judge

of probate believes that satisfactory evidence has been offered of the person's insanity he must make certificates as required by the board of regents, and send the insane patient to the hospital.

The superintendent of the state hospital may receive and detain for a period not exceeding five days, without an order from the probate judge, any person as insane whose case is duly certified by two reputable physicians to be one of violent and dangerous insanity. In addition, an application signed by a magistrate of the county or the mayor or alderman, intendant or warden of the county, city, or town in which such insane person resides or is found, must be left with the superintendent. The party committing the person must give a bond in the sum of \$100 to the treasurer of the institution, with condition that he will within five days procure an order for his commitment, and failing this that the insane person must be removed or discharged by the superintendent.

When the accommodations of the hospital are crowded, preference must be given to recent curable cases over chronic incurable cases. Preference is last given to idiots, or any who have been imbecile or weak-minded from childhood, to those who are subject to epileptic convulsions, and to those whose temporary insanity is produced by the use of alcoholic drinks or opiates.

The sheriff or other person in charge of any patient ordered to be conveyed to the state hospital for the insane must hold him without expense to the hospital until notified by the superintendent that the patient can be received.

(c) *Voluntary Admission*.—Any person making application for admission may be received at the discretion of the superintendent.

(e) *Cost of Commitment*.—The expense of committing patients and transporting them to the hospital must be paid out of their estate if they have any, or by the relatives liable for their support. In the case of indigent patients the cost is borne by the state.

4. **Conveying Patients to the Hospital**.—The judge of probate must depute the sheriff or his deputies or other officers or a friend or friends of a committed insane person, to convey him to the hospital.

5. **Transfer of Patients**. 6. **Parole and Discharge of Patients**.—The superintendent of the hospital, under the authority of the board of regents, must furlough any convalescent patient at the request of his relatives or friends for a period not exceeding three months. The relatives or friends must pay all the traveling expenses of the patient from and back to the hospital. If at the expiration of three months the patient has not been returned to the hospital, he must be entered as discharged, and re-admission cannot be obtained without recommitment as if the person had never been a patient in the hospital.

Whenever a patient has recovered, the regents must discharge him from the hospital.

7. **Cost of Maintenance**.—Indigent patients, residents of the state, are maintained at the expense of the state.

The judge of probate must make a thorough examination of disinterested, reliable witnesses under oath, and of records, as to the financial standing of the patient, the actual value of all property owned by him, and by the husband, wife, father, mother, sons, daughters of such patient, and also a statement of all debts due to and due by the patient and the relatives, and transmit to the superintendent of the hospital a report of his investigation. The superintendent or the board of regents must then decide whether the patient can be received as a beneficiary or as a paying patient, in whole or in part. If the patient is to be a paying patient the judge of probate must require a bond to be given with sufficient sureties.

If satisfactory evidence is adduced before the judge of probate that a paying patient in the hospital has since admission become indigent, he must at once notify the superintendent of the fact.

The board of charities must investigate the financial condition of all inmates and relatives liable for their support, having due regard for others dependent for support on the patient's estate. All the information in each case with conclusions and recommendations are submitted to the board of regents of the state hospital, which then decides what charges shall be made, and collects the amounts, if necessary calling on the attorney-general for aid. The state board of charities may cancel or modify any such order.

**8. Criminal Insane.**—Any judge of the circuit court is authorized to send to the state hospital for the insane every person charged with the commission of any criminal offense, who upon trial proves to be *non compos mentis*. When the person so sent is not a pauper, he must be supported out of his own estate.

## SOUTH DAKOTA

### Authorities:

Compiled Laws of South Dakota, 1913

Laws of South Dakota, 1915, 1917

**1. Administration and Supervision.**—(a) *General.*—The state board of charities and correction is composed of five persons, no three of whom may be residents of counties in which any state public institutions are located, appointed by the governor for terms of six years. The board has control of all state institutions including the hospitals for the insane, with power to examine all that pertains to the management and condition of these institutions and to demand information. In addition, the board has all the powers formerly possessed by the boards of trustees of the several institutions, including the appointment for the hospitals of the insane of medical superintendents, assistant physicians, stewards, and matrons.

The board or a majority of it must visit the institutions once a year (monthly visits by one or more members are required), and report to the legislature at each regular session.

(b) *Institutional.*—The superintendent of a hospital for the insane must be a physician of acknowledged skill and ability. He appoints



all employees and assistants, except those subject to appointment by the state board of charities and correction upon his recommendation, and may discharge any employee and suspend any resident officer.

2. **Care.**—(a) *In State Institutions.*—Yankton State Hospital, Yankton; established 1878; 1060 beds.

Land has been purchased at Watertown for another state hospital for the insane.

(b) *In Local Institutions.*—Insane persons who cannot be cared for at a state hospital or for whom admission to it is not sought may legally be provided for in the county poorhouses or asylums, which are under the management of the county commissioners as overseers of the poor; but in practice none are so maintained.

(c) *In Federal Institutions.*—Asylum for Insane Indians, Canton; established 1903; 48 beds.

3. **Commitment.**—(a) *Persons Committed.*—All residents of the state who become insane are entitled to be received at a hospital for the insane.

The residents of other states may be admitted upon the payment of the first cost of their support; provided, that no resident of another state may be received or retained to the exclusion of any resident. If any inmate be unwilling to accept gratuitous support the superintendent of the hospital is authorized to receive pay therefor.

(b) *Legal Procedure in Commitment.*—In each organized county there is a board of commissioners, consisting of three persons, styled commissioners of insanity. The county judge is a member of such board and its chairman; in case of his absence or inability to act, the state's attorney is ex-officio chairman of the board. The other two members are appointed by the board of county commissioners, one of whom must be a reputable physician and the other a practising attorney. One of these commissioners is appointed for one year, and the other for two years. In case of the temporary absence or inability to act of the two commissioners, the county judge must call to his aid a reputable practising physician or lawyer. The record of the cases must show this fact.

The commissioners have cognizance of all applications for admission to the hospital or for the safekeeping otherwise of insane persons within their respective counties, except in cases otherwise specially provided for. For this purpose, they have power to issue subpoenas and compel obedience thereto, to administer oaths, and do any act of court necessary and proper in the premises.

Application for admission to the hospital must be made in writing to the board of commissioners in the nature of an information verified by affidavit, alleging that the person is believed to be insane and a fit subject for custody and treatment in the hospital; that he is found in the county and has a legal settlement in it, if that is known to be the fact, or where he has a settlement.

The commissioners must at once investigate the grounds of the

information, and may require that the person for whom such admission is sought be brought before them for examination, or they may dispense with his presence. Any citizen of the county, or any relative of the person alleged to be insane, may resist the application, and may appear by counsel if they elect. The commissioners must appoint some regular practising physician of the county to examine the person alleged to be insane, and to report to the commissioners. The physician may or may not be of their own number. The physician must endeavor to obtain from the relatives of the person in question or from others who know the facts correct answers, so far as may be, to the prescribed interrogatories, which with answers must be attached to his certificate.

On the return of the physician's certificate, the commissioners must find whether the person is insane and a fit subject for treatment and custody in the hospital, and where his legal settlement is. If they find him insane and a fit subject for treatment and custody in the hospital, they must issue their warrant authorizing the superintendent of the hospital to receive him as a patient.

If it becomes necessary for want of room or other cause to discriminate in the general reception of patients into the hospital, a selection must be made as follows: (1) recent cases, of less than one year's duration; (2) chronic cases, of more than one year's duration; (3) those for whom application has been longest on file; (4) when cases are equally meritorious in all other respects the indigent are to be preferred.

When it is shown to the satisfaction of the commissioners that persons found insane cannot at once be admitted to the hospital, and that they cannot with safety be allowed to go at liberty, they must require suitable provision to be made for them until admission can be had, or until the occasion therefor no longer exists. Such patients may be cared for as private patients when relatives or friends obligate themselves to take care of and provide for them without public charge. In such cases the commissioners must appoint a suitable person a special custodian, to restrain, protect, and care for the patient; or they may be cared for as public patients, in which case the commissioners must place them in charge of the commissioners of the county or overseers of the poor, at the expense of the county. For lack of a poorhouse for the reception of such patients, or if no more suitable place can be found, they may be confined in the county jail; or the commissioners may require that such patients be taken to the asylum of any state designated by the governor, who is authorized to arrange terms for this purpose.

Persons alleged to be insane and whose admission to the hospital is not sought, may be provided for as either public or private patients in the county by the commissioners upon proof of their insanity and need of care; provided, however, that if any inmate of the South Dakota Soldiers' Home is adjudged insane, he must be cared for at the hospital for the insane at the expense of the state.

(c) *Voluntary Admission*.—Any person may receive treatment at the state hospital by subjecting himself to the custody and control of the superintendent, and paying quarterly in advance the sum of \$16 per month.

(d) *Appeal from Commitment*.—On a statement in writing, verified by affidavit, to the county judge of the county in which the hospital is situated, or of the county in which any person confined in the hospital has his legal settlement, that he is not insane, the judge must appoint a commission of not more than three persons to inquire into the merits of the case, one of whom must be a physician; and another an attorney, if two or more are appointed. Their report to the judge must be accompanied by a statement of the case and signed by the superintendent. If on such report the county judge finds the person not insane, he must order his discharge; if not, he must authorize his continued detention. The cost of the inquiry is to be paid by the county if the applicant is found to be sane; if not, then by the applicant. The commission provided for may not be repeated oftener than once in six months in regard to the same patient, and may not be appointed within six months of the time of the admission of any patient.

All persons confined as insane are entitled to the benefit of the writ of habeas corpus, and the question of insanity must be decided at the hearing. If the judge decides that the person is insane, the decision is no bar to the issuing of the writ a second time, whenever it shall be alleged that he has been restored to reason.

(e) *Cost of Commitment*.—The cost of committing an insane person is a charge upon the county in which he has a legal residence, but the expense of conveying patients to the hospital is paid out of the state treasury, although advanced by the county.

4. **Conveying Patients to the Hospital**.—When a person is to be sent to the hospital, the superintendent must send an employee, who has had experience in the care of insane persons, to take charge of him while en route to the hospital. The expense is paid by the state.

The county judge may authorize a relative or member of the family of the insane person, or some other person if competent to do so and the superintendent assents, to convey him to the hospital for the insane. Female patients must be accompanied by a female attendant.

5. **Transfer of Patients**.—Insane persons who have been under care as public or private patients outside of the hospital by authority of the commissioners of any county, may on application be transferred to the hospital, whenever they can be admitted, without another inquest at any time within six months.

6. **Parole and Discharge of Patients**.—Any patient who is cured must immediately be discharged by the superintendent. The relatives of any patient not susceptible of cure, and not dangerous to be at large, have the right to remove him by consent of the board of charities and correction. On application of the relatives or immediate friends of any patient in the hospital who is not cured, and who cannot be safely allowed to go at liberty, the commissioners of insanity of the



county in which the patient belongs, having made provision for his care within the county, may authorize his discharge from the hospital; but no patient charged with or convicted of homicide may be discharged without the order of the board. When patients are discharged from the hospital without application therefor, notice must at once be sent to the commissioners of insanity of the county where they belong, who must have them removed, and provide for their care in the county, unless the patients are discharged as cured. If the commissioners fail to remove a patient so discharged within thirty days, the county in which the patient belongs must pay at the rate of \$2 per day for the support of the patient at the hospital.

7. **Cost of Maintenance.**—The expenses for the care, board, and keeping of patients in the hospital for the insane is paid by the state. If the inmates are able to do so, they may be required to pay \$16 per month into the county treasury. Non-residents may be received upon payment of cost of maintenance in advance quarterly payments.

8. **Criminal Insane.**—If a doubt arises as to the sanity of a defendant to be tried on indictment or brought up for judgment, the court must order a jury to be impaneled. If the jury finds the defendant is insane, the trial or judgment must be suspended until he becomes sane, and the court, if it deems his discharge dangerous to the public peace or safety, may order him to be kept in charge of the sheriff until sane.

If the defense is insanity, the jury must state the fact if they acquit him on that ground; and the court may, if it considers the discharge of the defendant dangerous, commit him to the hospital for the insane until he recovers.

Whenever it appears to the satisfaction of the governor, by the representations of the warden of the state prison and board of charities and correction, that a convict sentenced by any court in the state has become insane, the governor, if he determines that the convict is insane, must order him transferred to one of the state hospitals for the insane, and that upon recovery, if before the expiration of his sentence, he be returned to the state prison.

## TENNESSEE

### Authorities:

Annotated Code of Tennessee, 1917  
Public Acts of Tennessee, 1917

1. **Administration and Supervision.**—(a) *General.*—The board of control consists of three electors, one from each grand division of the state, appointed by the governor, with the advice of the senate. The governor designates the president, and the board elects one member vice-president, and the other fiscal supervisor. The board appoints its secretary and other employees. Members hold office for six years, but are removable by the governor. The salary of the president is \$4000; that of the other members, \$3600; actual official traveling expenses are allowed.

The members devote their entire time to their official duties, and

have all power and authority necessary for the full and efficient exercise of administrative, executive, and fiscal supervision over all the state institutions. The board determines the number of officers and employees and fixes their salaries. It may discharge any employee. All supplies are purchased by the board. Each institution must be visited at least once a month by a member of the board. The board reports annually to the governor.

Private institutions for the insane may be established under the direct control of a physician in charge, who must be a reputable and licensed physician, a graduate of a recognized medical school, with at least five years' experience in treating insanity. A license must be obtained from the clerk of the county court in which the proposed institution is located. No license may be granted until the applicant delivers to the clerk a sworn statement of the proposed physician in charge, showing that he is properly qualified.

(b) *Institutional*.—There are no local boards of trustees. Each state hospital is under the executive management of a superintendent appointed by the board of control, subject to the approval of the governor, for a term of four years, unless removed after a hearing on charges. He appoints the necessary employees, but not more than 10 per cent. of the total number may be from the same county. The superintendents are the treasurers of their respective hospitals and must give a surety bond.

2. **Care**.—(a) *In State Institutions*.—Central Hospital for the Insane, Nashville; established 1852; 700 beds.

Eastern Hospital for the Insane, Bearden; established 1886; 620 beds.

The Western Hospital for the Insane, Bolivar; established 1889; 700 beds.

(b) *In Local Institutions*.—Four counties maintain asylums for the insane or insane departments in connection with the almshouses, under the management of the commissioners of the poor elected by the county. Each of the other counties must maintain its own poor asylum, to which the insane may be admitted who cannot be cared for at the state hospitals. The rulings of the county commissioners in regard to admissions are subject to revision by the county court.

3. **Commitment**.—(a) *Persons Committed*.—All insane persons who have legal citizenship and residence in the state may be admitted to the state hospitals.

(b) *Legal Procedure in Commitment*.—Insane persons may be placed in a hospital by their legal guardians or by their relatives or friends in case they have no guardians, or by a justice of the peace, upon proper proof of their insanity.

In order of admission, the indigent insane of the state have precedence of paying patients, and recent cases of both classes have precedence over those of long standing.

An insane person may be committed to a private institution in the same manner as provided for the commitment of insane persons to the

state or county hospitals for the insane; or commitment may be made upon a petition to the chancery or county court by the husband, wife, child, parent, brother, or sister, or guardian, or the next of kin of the alleged insane person, or by the person at whose house the alleged insane person resides, and a certificate of lunacy made by two reputable physicians of at least two years' experience in the practice of medicine, and upon the order of a judge of the court. The petition must contain a sworn statement of the degree of relationship of the alleged insane person, his color, sex, age, civil condition, occupation, place of residence, and duration of his insanity, the facts indicating his insanity, and the name of the institution to which it is desired to have him committed. The two physicians must jointly make a final examination of the alleged insane person within ten days next before the granting of the order of commitment.

Neither of the physicians may be a relative of the person applying for the order of commitment, or of the insane person, or be an officer of or be in any way pecuniarily interested in the institution to which commitment is sought. Personal notice of the application for his commitment must be served upon the alleged insane person at least one day before the order is granted; but the judge may dispense with such personal service upon the affidavit of the examining physicians that it would be detrimental to the patient.

When the condition of an alleged insane person renders necessary his immediate confinement in an institution for the insane, a private institution may receive him upon the petition and certificate of lunacy for a period of time not exceeding five days, and before its expiration, an order must be secured for his regular commitment. In such a case, the medical examiners must certify that the person in question should immediately be confined in an institution for the insane.

Inmates of institutions and persons held for commitment proceedings who flee from the state may be returned to the state and to the institution upon the requisition of the governor. Fugitives from other states may be returned upon the requisition of the governor of the state from which the person fled.

(c) *Voluntary Admission.*

(d) *Appeal from Commitment.*—An alleged insane person may prosecute an appeal or a writ of error, in proper person, from an adverse judgment in a proceeding of inquisition of lunacy. Any person restrained of his liberty may prosecute a writ of habeas corpus, to be granted by any judge.

(e) *Cost of Commitment.*—The county from which an indigent person is sent must pay the expense of his transportation to and from the hospital, as well as other expenses connected with his commitment.

4. **Conveying Patients to the Hospital.**—The clerk of the county has the duty of issuing a warrant to some suitable person for the conveyance of an insane patient to a hospital.

5. **Transfer of Patients.**—An insane person may be transferred from the custody of a state or county asylum or hospital to the custody of



a private institution, or vice versa, upon a certified copy of the original order of commitment made by the superintendent or physician in charge of the institution from which the patient is transferred.

**6. Parole and Discharge of Patients.**—Patients in state hospitals must be removed whenever, in the judgment of the superintendent and the board of control, it may be judicious and proper for the interests of the hospital, the patient, and the community.

The physician in charge may at any time discharge a patient committed to a private institution as insane when, in his opinion, the patient has recovered, or his condition does not render him dangerous to himself or others if at liberty, or may discharge him to custody of a person authorized to make the petition.

The physician in charge of a private institution may parole a committed insane person to the custody of a responsible relative or friend for a period not exceeding thirty days. If the patient is returned to the institution before the expiration of that time, he may be re-admitted upon the original order of commitment. Before the expiration of this period of thirty days, he may in like manner be admitted to any state or county hospital or asylum or other licensed private institution for the insane upon a certified copy of the original order of commitment. If not returned to the custody of the institution or admitted to some other institution upon the original order, he must be discharged at the expiration of his period of parole.

**7. Cost of Maintenance.**—The county from which an indigent patient is sent must pay the cost of his maintenance at the hospital and provide the necessary clothing.

When a person committed to the hospitals for the insane has estate, the income of which is insufficient to pay for his support at the hospital, the same may be appropriated toward the payment for his support; provided, that the patient has no family or dependents.

The county court clerks of the various counties are required to report to the superintendents of the several hospitals for the insane the names and amounts in value of the estates belonging to insane persons who have been committed.

**8. Criminal Insane.**—A court if satisfied that a person indicted for a criminal offense has been insane for four successive terms may discharge him upon recognizance of sufficient sureties for his appearance at the next term, and may renew this recognizance from term to term so long as the defendant continues insane.

If, in behalf of a person not previously known to be insane, who is charged with a criminal offense punishable by imprisonment in the penitentiary or death, the plea of insanity is urged, the court must charge the jury that if they believe the defendant to be insane they shall so find, and he shall be committed to a hospital. The powers of courts to commit to the hospital for the insane do not extend to insane persons arraigned for felonious assaults or misdemeanors only, or to those who may be admissible to the hospitals for the insane under the general laws of commitment.

When, in the opinion of the board of control and superintendent, a patient committed as criminal insane has recovered, they must deliver him to the jailor of Davidson County for safekeeping, and notify the clerk of the county in which he was arraigned of the fact. If, at the next term of the court, the district attorney wish further to prosecute such person, he must be delivered to the jailor of the county in which he was arraigned.

## TEXAS

### Authorities:

Vernon's Sayle's Texas Civil Statutes, 1914

Laws of Texas, 1917

**1. Administration and Supervision.**—(a) *General.*—There is no state board having general control or supervision of the insane or of the institutions in which they are kept.

(b) *Institutional.*—The general control, management, and direction of the affairs of the Texas hospitals for the insane are vested in boards of managers, each hospital having its own board consisting of six members, appointed by the governor for terms of six years. The board of managers has power to make all necessary by-laws and regulations for the institution and its inmates; to elect a superintendent; to make all other appointments on the nomination of the superintendent; to determine salaries and wages; to discharge upon the recommendation of the superintendent any officer or employee or patient, etc.

The superintendent must be a married man, a skilful physician, and experienced in treating cases of insanity.

**2. Care.**—(a) *In State Institutions.*—State Lunatic Asylum, Austin; established 1857; 1680 beds.

North Texas Hospital for the Insane, Terrell; established 1885; 1900 beds.

Southwestern Insane Asylum, San Antonio; established 1891; 2000 beds.

The 1917 session of the legislature provided for the establishment of the Northwest Texas Insane Asylum, and for the establishment of an Asylum for the Negro Insane at Rush.

(b) *In Local Institutions.*—In counties having almshouses the insane who cannot be admitted to the state hospitals may be cared for in them. The county commissioners have responsibility for such cases and manage the almshouses.

**3. Commitment.**—(a) *Persons Committed.*—All persons who have been judged insane by a court of competent jurisdiction (public patients) are entitled to admission to the state hospitals. Persons certified to be insane by some reputable physician in accordance with law (private patients) may be admitted. Idiots who can safely be kept in the county in which they belong and persons suffering from an infectious or contagious disease are excluded from the hospitals.

(b) *Legal Procedure in Commitment.*—Before any person can be received at a hospital as a patient, the parent or legal guardian of

such person or some near relative or other person interested must present a written request to the superintendent, giving such particulars as may be required. The request must be under oath and accompanied by an affidavit of the examining physician, showing that he has made a careful examination of the patient and thoroughly believes him to be insane, and by a certificate from the county judge of the county where the alleged insane person resides. A complete history of the patient must be forwarded to the medical superintendent with the application for admission.

If an affidavit be filed with any county judge or justice of the peace that any person in the county needs to be placed under restraint because of insanity, and the judge believes the statement true, the county judge sets a hearing of the case before a commission of six men, as many as possible of whom shall be physicians, and depending upon the population from one to six must be physicians. (This provision requiring that physicians sit on the commissions has been declared unconstitutional by certain county judges, but is observed in most parts of the state.) The affiant of the affidavit is represented by the county attorney, and the respondent must be represented by counsel secured by himself or appointed by the judge. The various issues to be submitted to the commission are minutely specified, and relate not only to the question of the defendant's sanity or insanity, but to his age, nativity, the character of attacks and their duration, whether insanity is hereditary in his family, whether the defendant is possessed of any estate, and whether there are any persons legally liable for his support. Upon the return of a majority report that the respondent is of unsound mind and should be placed under treatment and restraint, the county judge must pronounce judgment in the presence of the respondent and order him conveyed to one of the lunatic asylums. The judge shall then ascertain if there is a vacancy.

If accommodations cannot be provided for all persons for whom application has been made, preference must be given in all instances to public over private patients, and of the former class, to cases of less than one year's duration over chronic cases. No private patient may be admitted during the pendency of an application by a public patient.

(c) *Voluntary Admission.*

(d) *Appeal from Commitment.*

(e) *Cost of Commitment.*—The cost of commitment and of transporting an insane person to a hospital is paid by the county from which he is sent unless he has sufficient estate to bear the expense.

**4. Conveying Patients to the Hospital.**—Upon the warrant of the county judge, the sheriff or some other suitable person must convey him to the hospital.

A female patient must be accompanied by a woman or by her husband, father, brother, son, uncle, or nephew.

**5. Transfer of Patients. 6. Parole and Discharge of Patients.**—All patients, except those charged with or convicted of some offense



and adjudged insane, may be discharged from a hospital at any time upon the recommendation of the superintendent approved by the board of managers. Any patient coming within the above exception may only be discharged upon order of the court by which he was committed.

**7. Cost of Maintenance.**—All indigent public patients are maintained at the expense of the state. All public patients not indigent must be maintained at the expense of the state in the first instance, but in such cases the state is entitled to proper reimbursement.

The commissioners' court has power to provide for the support of idiots and lunatics who cannot be admitted into the lunatic asylum, residents of their county, who are unable to support themselves. By the term resident as used herein is meant a person who has been a *bona fide* inhabitant of the county not less than six months and of the state not less than one year.

**8. Criminal Insane.**—The process of commitment is the same as for an insane person not a convict (Section 3, *b*), except that when the person is confined in the state penitentiary all proceedings and hearings must be held there.

When a convict is discharged from a state penitentiary, and is insane at the time of his discharge, and is so adjudged by a competent court within thirty days, he must be conveyed to one of the hospitals for the insane at the expense of the state.

## UTAH

### Authority:

Compiled Laws of Utah, 1917

**1. Administration and Supervision.**—(*a*) *General.*—The board of insanity, consisting of the governor, state treasurer, and auditor, has the supervision and control of all insane persons in the state, whether they reside in the hospital or some other place.

The board of insanity has the general control and management of the affairs of the state mental hospital. It is required to hold monthly meetings at the hospital, and must make a careful inspection of the institution at least once in three months.

(*b*) *Institutional.*—There is no local board of trustees. The medical superintendent, who is appointed by the state board of insanity, must be a well-educated, experienced physician who has practised five years. With the approval of the board he appoints all attendants and employees, fixes their compensation, and has power to remove them.

**2. Care.**—(*a*) *In State Institutions.*—State Mental Hospital, Provo; established 1885; 500 beds.

(*b*) *In Local Institutions.*—The county commissioners, who are the overseers of the poor, are bound to provide for such insane as may not be received at the hospital and may care for them at poor farms or other institutions.

**3. Commitment.**—(*a*) *Persons Committed.*—All insane persons who

are residents of the state are entitled to admission to the hospital, also feeble-minded and non-insane epileptics capable of mental improvement, but other feeble-minded, a purely senile dement, a person in an unconscious condition, an infant, a child under ten years of age, and a person suffering from a contagious or infectious disease are not admitted.

(b) *Legal Procedure in Commitment.*—Application for admission of patients must be made to the judges of the district courts, except in cases otherwise provided for. In the absence of a district judge the judge of any other district may act upon the application at the written request of the clerk of the district court of the county wherein the alleged insane person resides, or the chairman of the board of county commissioners may so act.

The application for admission to the hospital must be in the form of an information, properly verified, alleging the person for whom application is made to be insane, and a proper person for care and treatment, and stating facts in regard to his residence, etc.

The district judge of the county may examine the informant under oath and require the person for whom admission is sought to be brought before him. If satisfied that there is reasonable cause a hearing must be had, and the district attorney notified. Any citizen of the county or any relative or a friend of the person for whom application is made may resist the application, and may appear by counsel. The district attorney must represent the state in such examination. The judge must summon two practising physicians before whom the examination is to be conducted.

The physicians must certify under oath whether or not the person is insane, whether the case is of recent or curable character, whether the person has a homicidal, suicidal, or incendiary mania. They must also obtain from others correct answers to the interrogatories of the certificate as prescribed by law. If the judge upon the conclusion of his investigation finds the person insane, and one who ought to receive care and treatment at the hospital, he must order his commitment.

When discrimination in reception of patients is necessary, they take precedence in the following order: (1) cases of less than one year's duration; (2) chronic cases of more than one year's duration, presenting the most favorable prospects for recovery; (3) those for whom application has been longest on file. When cases are equally meritorious, indigent patients are to be preferred.

When notified by the board of insanity or the superintendent of the hospital that a person committed to the hospital cannot be received for want of room, the board of county commissioners must provide suitably for him until admission can be had, or the occasion for it no longer exists.

Non-residents of Utah, conveyed to or coming into the state, may, upon the written recommendation of the board of county commissioners, be returned by the board of insanity to their homes or friends,

and must not be permitted to be supported in the hospital. But persons stricken with insanity while traveling through or temporarily sojourning in the state may be committed to and cared for temporarily in the hospital.

(c) *Voluntary Admission.*

(d) *Appeal from Commitment.*—Upon an affidavit or other evidence that a patient in the hospital is not insane or not a proper person to be cared for at the hospital, the board of insanity must ask inquiry by the district judge of the district in which the patient is held. If the patient is found to be sane, he must be discharged; if not, the judge must order his continued detention, and may order the parties demanding the inquiry to pay its cost.

(e) *Cost of Commitment.*—The cost of commitment is paid by the county from which the patient was sent unless he has estate sufficient to pay the same.

4. **Conveying Patients to the Hospital.**—The sheriff or other person appointed to execute the warrant of the district judge must convey the patient to the hospital and deliver him, together with the copies of information, physicians' certificates, and warrant, to the superintendent of the hospital. No female may be taken to the hospital without the attendance of some other female or relative. If any relative or immediate friend, who is suitable, shall request, he has the privilege of executing the warrant in preference to the sheriff.

5. **Transfer of Patients.** 6. **Parole and Discharge of Patients.**—By order of the judge of the district court issuing the commitment, a patient may be returned to his relatives or friends. Application must be made to the judge, and satisfactory evidence produced that the patient will be given proper care. The applicants must give bonds to the district court of the county. If subsequently it is brought to the knowledge of the judge that a person thus removed from the hospital is not properly cared for or is not fit to be at liberty, he may order the return of such person to the hospital; but no patient under a criminal charge or conviction may be discharged from the hospital without the order of the court having jurisdiction of the case. If it appear upon sufficient evidence that any patient in the hospital is not insane, or is unjustly deprived of his liberty, or is not one who should receive care and treatment in the hospital, the board of insanity must request immediate inquiry by the district judge who may order his immediate discharge.

When it becomes necessary for want of room or other cause to remove any patient, the superintendent must give notice to that effect to the several clerks of the district courts. Only harmless and incurable patients may be removed by the board of insanity.

7. **Cost of Maintenance.**—The state pays the cost of maintaining all indigent patients. In case a patient has sufficient means to pay any part of the cost of maintenance at the hospital, the judge must appoint a guardian for him. The immediate relatives of an insane person are liable for his support.



Provision is made for the reimbursement to the state from the estate of persons declared insane, and for the recovery of expenses of commitment and support in the case of non-indigent persons, for the appointment of a guardian under bond in the case of non-indigent insane who are committed, and for recovery from persons liable for the support of an insane relative.

**8. Criminal Insane.**—When a person charged with crime has escaped indictment or been acquitted on trial by reason of insanity, or when a person during trial or while confined as a criminal in the state prison or a county jail becomes insane, the district judge of the county must act in the case and may submit the matter to a jury.

If the jury find the defendant insane he must be committed to the state mental hospital; provided, the court deems his freedom a menace to public quietude. Proceedings against the defendant must be suspended until he becomes sane.

A person thus committed must be detained at the hospital until he becomes sane. If then his sentence has expired, he must be restored to liberty. Otherwise, the superintendent must give notice of his recovery to the sheriff of the county from which he was sent, who must place him in proper custody until he is brought to trial or judgment, or return him to prison to serve out the remainder of his term. The time of his confinement in the state mental hospital must be deducted from his term.

The expenses of the examination and sending of such persons, except convicts in the state prison, to and from the state mental hospital, are chargeable to the county from which they have been sent. But the county may recover from their estates, or from a relative legally bound to care for them, or from the county of which they may be resident. In the case of an indigent insane convict, the costs are borne by the state.

## VERMONT

### Authorities:

Public Statutes of Vermont, 1906

Laws of Vermont, 1908, 1910, 1912, 1915, 1917

**1. Administration and Supervision.**—(a) *General.*—The board of control consists of the governor, state treasurer, auditor of accounts, director of state institutions, and a person appointed by the governor with the consent of the senate for a term of two years. The members receive their expenses while engaged in official business, except the member appointed by the governor, who receives in addition \$8 a day for the actual time spent in his official capacity.

The board has power to examine each institution of the state, and require monthly reports from them. If the money appropriated for the support of the institution is not being properly expended, further expenditure may be prohibited.

The board must hold monthly meetings at the capitol or elsewhere, and must annually or as often as deemed proper visit each institution under its control, inspect the management, and hear complaints of the

inmates, and direct changes which must be made by the director of state institutions. The board must report biennially to the legislature.

The governor may appoint a woman to accompany the board upon its visits for the purpose of inspecting and investigating the care of female inmates. The woman visitor receives \$5 a day and expenses while visiting institutions.

The director of state institutions, who is appointed by the governor with the consent of the senate for a term of two years, has the general care, control, and management of all the state institutions, including the hospital for the insane. All the powers, duties, and liabilities of the former boards of trustees of the various state institutions are imposed upon him. He receives a salary of \$3000 a year and expenses, and devotes his entire time to the duties of his office. The director makes all needful rules and regulations for the government of the institutions, employs and removes at pleasure all physicians, teachers, clerks, and employees, and fixes their compensation. He must visit the institutions as often as once a month, and must make a yearly investigation of their accounts and report biennially to the governor.

(b) *Institutional*.—There are no local boards of trustees.

2. **Care**.—(a) *In State Institutions*.—Vermont State Hospital for the Insane, Waterbury; established 1888; 700 beds.

The state also supports patients in a hospital under private management: Brattleboro Retreat, Brattleboro; established 1834; 400 beds.

(b) *In Local Institutions*.—Insane persons who cannot be cared for in the hospitals may be kept at almshouses under the charge of the overseers of the poor of the town.

3. **Commitment**.—(a) *Persons Committed*.—All insane persons, residents of the state, are entitled to admission to the hospitals for the insane, except idiots and demented persons, when they are not dangerous.

(b) *Legal Procedure in Commitment*.—Admission to a hospital for the insane as a patient or inmate is upon a certificate of insanity made by two legally qualified physicians, residents of the state. The physicians must not be members of the same firm, officers of a hospital for the insane in this state, nor members of the board of control. The physicians must make oath to the certificate before a magistrate, who must append his jurat, and certify that said physicians are of unquestionable integrity and skill. The certificate must not be made more than ten days before the admission of the insane person to the hospital for the insane, unless a longer time is required to dispose of an appeal taken from the decision of the physicians. The physicians are required to examine the supposed insane person not more than five days previous to making the certificate; and a physician who signs a certificate without making a previous examination shall, if the person is admitted to a hospital for the insane upon the certificate, be imprisoned not more than two years or fined not more than \$1000, or both.

A person may be received into a hospital for the insane pursuant to an order or sentence of the supreme or county court without the physicians' certificate.

(c) *Voluntary Admission*.—The superintendent of a hospital for the insane may receive as a voluntary patient, a person who seeks treatment and makes written application without a certificate of two physicians. He may not be detained after having given forty-eight hours' notice in writing that he desires to leave the institution.

(d) *Appeal from Commitment*.—The next friend or relative of a person whose insanity is so certified may appeal from the decision of the physicians to the state board of control for a review of the case. An alleged insane person may not be received in a hospital for the insane while an appeal is pending before the board of control.

(e) *Cost of Commitment*.—The costs of the examination and removal of an insane person are chargeable to the town of his residence when the town authorities seek his commitment.

**4. Conveying Patients to the Hospital. 5. Transfer of Patients. 6. Parole and Discharge of Patients.**—The board of control may discharge conditionally an incurable insane person from a hospital, subject to revocation. It may discharge any person wrongfully confined or so far sane as to warrant discharge, but not without giving the superintendent opportunity to be heard.

The superintendent of the state hospital or of the Brattleboro Retreat may grant a furlough of not exceeding thirty days to any patient or inmate under his charge, supported in whole or in part by the state, and may extend it in his discretion, not exceeding thirty days in the aggregate.

**7. Cost of Maintenance.**—Insane persons in a town, destitute of means of support, and having no relatives in the state bound by law to support them, are supported by the state while in a hospital for the insane. On application of the overseer of the poor of such town, the selectmen or the county auditor upon his own motion must ascertain whether the insane person is liable to be supported by the state, and may institute a court of inquiry before the judge of probate. The inquiry must be attended by the state's attorney of the county for the protection of the interests of the state.

When a person is lawfully discharged from a hospital or the Retreat, the town causing his commitment must take charge of and support him.

No patient may be supported in the state hospital or the Retreat entirely at the expense of the state unless he is removed upon the order of a judge of probate, or from the state prison or house of correction, or upon the order or sentence of the supreme or county court.

**8. Criminal Insane.**—A county judge, if satisfied that a plea of insanity will be made in behalf of a person indicted for a criminal offense, may order him to be detained at the state hospital till the truth of the plea can be ascertained.

When an indictment is not found or a person is acquitted of a criminal charge on the ground of insanity, the court may commit the person to the county jail or to the state hospital. He may be discharged only on the order of the county court by which he was committed.



The superintendent of the state hospital must receive all insane criminals ordered committed, for whom separate accommodations are provided. A person confined in the state prison or house of correction or a county jail for a specified time or for life, who becomes insane, may be removed to the Vermont State Hospital for the Insane only upon the order of the governor after expert examination as to his insanity, to remain until the expiration of the term for which he was committed. If he becomes sane before its expiration, he must, upon the order of the governor, be returned to the institution to which he was originally committed and confined there for the remainder of such term. A prisoner who, at the expiration of his term of confinement, remains insane, may be removed to the state hospital; or if already there, may remain, at the expense of the state, until his residence is ascertained or some relative is ordered by the proper court to furnish his maintenance.

## VIRGINIA

### Authorities:

Code of Virginia, 1904

Supplement to Code of Virginia, 1910

Laws of 1911, 1916

1. **Administration and Supervision.**—(a) *General.*—The state board of charities and correction is composed of five members, appointed by the governor for terms of five years, subject to removal by him for cause. Failure to attend at least one meeting during the year, unless excused, may be construed by the governor as a resignation of the non-attending member.

The duties of the board are strictly visitorial and advisory, without administration or executive powers. It must visit, as a whole, or by a committee or by its secretary, all state, county, municipal, and private charitable and correctional institutions at least once a year, but the hospitals for the insane must be visited as often as once in six months and by at least two members of the board.

The board appoints an executive secretary and an assistant, and their salaries are fixed by the legislature.

Every superintendent of a hospital must make a quarterly report to the board in such form as it may prescribe, and also to the auditor of public accounts, regarding financial matters. The board must collect and publish statistics in regard to the defective classes, both in and out of institutions, and make an annual report to the governor.

(b) *Institutional.*—Each of the hospitals for the insane has a special board of directors consisting of three members, appointed by the governor for terms of six years. The directors of the special boards constitute a general board of directors for all the hospitals. The ex-officio chairman of the general and special boards of directors is the commissioner of hospitals, appointed by the governor for four years. The members of the boards receive no compensation. The commissioner receives a salary of \$2500 a year and \$500 for traveling expenses.

The commissioner is responsible for the proper disbursement of all moneys appropriated or received for the maintenance of the hospitals. He must be a skilled accountant, and is required to establish at all the hospitals a uniform system of keeping records and accounts, and to make annually to the governor a complete record of the business affairs of each hospital, with estimates of moneys needed, and recommendations for the improvement of the hospitals and their management.

Each special board of directors is required to hold twelve regular meetings at the respective hospitals during the year. The general board of directors during each year holds one regular meeting at each hospital for the insane. The general board of directors, constituted for the control and management of all the state hospitals, appoints for each hospital for a term of four years a superintendent who must be a skilled physician, and who is removable by the board for cause. The special board of each hospital, subject to the approval of the general board, appoints for terms of four years other resident officers. Each special board is required to make an annual report to the governor in regard to the hospital under its management. The superintendent of each hospital appoints all employees and some resident officers, may remove them, and fixes their compensation, subject to the approval of his special board.

2. **Care.**—(a) *In State Institutions.*—Eastern State Hospital, Williamsburg; established 1768; 755 beds.

Western State Hospital, Staunton; established 1828; 1200 beds.

Central State Hospital, Petersburg; established 1869; 1800 beds (for negro insane).

Southwestern State Hospital, Marion; established 1887; 720 beds.

(b) *In Local Institutions.*—Insane persons who cannot be received into the state hospitals may be provided for in the county poorhouses, which are under the management of the boards of county supervisors. The overseers of the poor of each county or the council of a town are charged with the relief of the poor, including the insane. (All insane are now provided for in the state hospitals.)

3. **Commitment.**—(a) *Persons Committed.*—All legal residents of the state, who are insane, not idiots, are entitled to admission to the hospitals for the insane.

The examining board may receive any person for whom application is made for admission to a hospital if the person making it executes an obligation, with sufficient surety for the payment of the cost of maintenance and care of the insane person and other necessary expenses. But no non-resident insane person may be admitted or retained in any hospital under any contract with the board except when there is a vacancy not applied for on behalf of a resident of the state. A non-resident pay patient may at any time be discharged by the board, which must do so if it is necessary in order to make room for a resident of the state.

(b) *Legal Procedure in Commitment.*—Any county or corporation judge, or any justice of peace, who suspects any person in his county

or corporation to be insane, or upon the written complaint or information of any respectable citizen, must order the presence of such person, and summon two licensed and reputable physicians (one of whom must, when practicable, be the physician of the suspected person, but neither may in any manner be related to him or have an interest in his estate). The judge or justice and the two physicians constitute a commission to inquire whether the person is insane and a suitable subject for treatment in a hospital for the insane, and for that purpose must summon witnesses. The physicians must, in the presence of the judge or justice (if practicable), by personal examination and by inquiry satisfy themselves and the judge or the justice as to the mental condition of the person examined. If the two physicians do not agree a third is to be summoned. The report of the commission must consist of a statement with questions and answers prescribed by the law, and of any further information bearing on the insanity of the person being examined. The record of proceedings together with the warrant of commitment must be made in duplicate, one copy to be delivered to the sheriff or sergeant of the county or city, and the other to be filed in the office of the county. If the commission decides that the person be insane and ought to be confined in a hospital, and ascertains that he is a citizen of the state, the judge or justice may order him confined in jail for a period not exceeding six days, pending conveyance to a hospital for the insane, or may commit him to the custody of some responsible person, who must furnish security for his proper safe-keeping without cost to the commonwealth until he is taken to the hospital or discharged from custody.

The sheriff or sergeant to whose custody an insane person has been committed, must on the same day the person is adjudged insane make application for admission to the nearest appropriate hospital, unless instructed otherwise by the commissioner of hospitals transmitting with the application a copy of the record or proceedings before the commission. As soon as the record of proceedings before the commission of insanity is filed in the office of the county clerk or clerk of the county court, the clerk must at once notify the commissioner of state hospitals for the insane, giving the name, age, sex, and color of the insane person, the date of the finding of the commission, and the custody to which he was committed. If the insane person has been committed to jail, and remains there after six days from the date of the finding of the commission, the clerk must notify the commissioner of state hospitals. If the superintendent of a hospital fails to send for any insane person confined in jail within six days after his commitment thereto, the commissioner of state hospitals for the insane must order the sheriff or sergeant in whose custody the insane person is to convey him to some hospital.

A person admitted to a hospital as insane must be detained until the superintendent and his assistant have ample opportunity to observe and examine him. If they are of the opinion that he is not insane, he must, unless he be charged with or convicted of crime, be



returned by the hospital authorities to the county or city from which he was committed, with a certificate of discharge.

If a commission in insanity finds the person examined by it insane and a non-resident of the state, the same proceedings are to be had as if he were a resident. A statement of the fact of his non-residence and place of domicile must accompany any order respecting him; and the superintendent, if the person is sent to a hospital, or the court to whose jail he may have been committed, must have him returned to his friends, if known, or the proper authorities of the state or county from which he came, if practicable.

If a person be found to be insane by a judge or justice of the peace, or in a court in which he is charged with crime, the court of the county or corporation in which he is an inhabitant must appoint a committee for him.

If a resident of the state is suspected of being insane, but has not been so found, the court of his county or corporation must, upon proper application, examine his state of mind and appoint a committee of his person if he is found insane.

A similar procedure, except as to examination, is prescribed in the case of a non-resident who is suspected of being insane and who has property in the state.

(c) *Voluntary Admission*.—A legal resident of the state in the early stages of insanity, whose mental condition is such as to render him competent to make application or whose application if he is not of the age of twenty-one years is made by parent or guardian, may be received by the superintendent of a state hospital as a voluntary patient; provided, that his mental derangement is not the temporary effect of alcohol or any drug, and provided that his admission does not deprive any committed patient of treatment in the hospital.

Such a patient may be detained not more than ten days after giving notice of his intention to leave or after notice has been given by another for him.

Every voluntary patient is required to defray his own expenses, except that the board of directors of the hospital may exempt him for payments for two months if they consider him financially unable to defray his expenses.

(d) *Appeal from Commitment*.—Any person held as insane may by means of a writ of habeas corpus have the question of the legality of his detention and of his sanity determined by a court of competent jurisdiction. If he is in custody, he may file his objection in the circuit court of the county or city in which he resides, or in which he was adjudged insane, and after notice to the authorities of the hospital or to the person claiming the right to the custody of such person, the court must determine whether the person is sane or insane.

(e) *Cost of Commitment*.—All expenses incurred in committing a patient to any state hospital are to be borne by the county or corporation from which he is sent.

4. *Conveying Patients to the Hospital*.—The superintendent of a

hospital must forthwith send an attendant from the hospital to conduct the insane person for whom application for admission has been made; or the superintendent may appoint some other suitable person for the purpose or may order the sheriff or sergeant of the county or city to convey him to the hospital. The cost of conveying insane persons to the hospital is paid from the funds appropriated for this purpose by the state. The cost of transportation of a voluntary patient is not borne by the hospital.

**5. Transfer of Patients. 6. Parole and Discharge of Patients.**—The superintendent of a hospital must in suitable cases grant furloughs to insane patients for such time as, in his judgment, may benefit them; but all costs of removal for furloughs must be paid by the patients or friends, if able to do so.

When an insane person confined in a hospital or jail is restored to sanity, the superintendent or the court must discharge him and give him a certificate of discharge.

Except in the case of a person charged with crime or convicted of crime, the superintendent of any hospital or the court of any county or corporation, may deliver an insane person to a friend who will give bond with surety for his maintenance. When an insane person, except as aforesaid, is deemed by the superintendent both harmless and incurable, he may deliver him without bond to any friend who is willing and able to take care of him without cost to the commonwealth. If a friend into whose charge an insane person has been given delivers him to the sheriff of the county or sergeant of the corporation, according to the condition of the bond, the latter must bring the insane person before a judge or justice of his county or corporation for a re-examination.

**7. Cost of Maintenance.**—The expenses of removing and supporting insane persons are paid out of the state treasury upon the order of the commissioner of hospitals. But when the insane persons have sufficient estate and have no husband, wife, child, or kin dependent on them, it must be applied to such expenses.

The commission or court ordering an insane person to be confined in a hospital must cause a certificate of his estate, or, if the person be a married woman or infant, who is not an orphan, of the estate of the husband and any separate estate of the wife, or estate of the parent, and also of the probable annual profits of such estate, to be sent to the directors of the hospital, and to the next court or corporation of which the insane person is an inhabitant.

**8. Criminal Insane.**—If any person charged with crime is found by the court to be insane and the court orders him committed to the department for the criminal insane at one of the state hospitals, he must be kept there until restored to sanity. If prior to the time of trial the court or the attorney for the commonwealth believes that such person requires care and observation in such a hospital, the court may appoint one or more experts in insanity or other qualified physicians not exceeding three to examine him, and may commit him to

the department for criminal insane. A copy of the complaint or indictment and the medical report must be delivered with the patient to the superintendent of the hospital.

When the superintendent considers such a patient not insane or restored to sanity he must be returned to jail.

Any person after conviction of crime or while serving sentence in any penal institution or reformatory, if declared insane by jury, must be committed to the department for the criminal insane at the proper state hospital and kept there until restored to sanity.

In case an order of commitment is made as provided in any of the preceding paragraphs, the sheriff must immediately ascertain whether a vacancy exists at the proper hospital in the department for the criminal insane. Until there is a vacancy the insane person shall be kept in the county jail, penitentiary, reformatory, or in such custody as the court may order.

## WASHINGTON

### Authorities:

Remington's Codes and Statutes of Washington, 1916  
Laws of 1915, 1917

1. **Administration and Supervision.**—(a) *General.*—The state board of control consists of three citizens of the state, no more than two of whom may belong to the dominant political party, appointed by the governor for six years, and removable at his discretion. Each member of the board receives a salary of \$3000 per annum, and necessary expenses.

The board has power to make all repairs and improvements that, in its judgment, may be necessary for the conduct of the hospitals under their charge. It takes charge of the general interests of the hospitals, supervises the transportation of patients, employs superintendents; and may prescribe the duties of all persons connected in any way with the management of the hospitals.

The board of control is required to arrange with the United States Bureau of Immigration for deportation of the alien insane.

(b) *Institutional.*—The superintendent must be a skilful practising physician, and holds his office for such time as the state board of control may deem wise. He has entire control of the treatment of the patients and of all other internal government and economy of the institution, appoints all subordinate officers and employees, and has entire direction of them.

2. **Care.**—(a) *In State Institutions.*—Western State Hospital, Fort Steilacoom; established 1870; 1466 beds.

Eastern Hospital for the Insane, Medical Lake; established 1889; 1100 beds (also criminal insane).

Northern State Hospital for the Insane, Sedro Woolley; established 1909; 700 beds.

(b) *In Local Institutions.*—The indigent insane who cannot be admitted to the state hospitals must be cared for by their respective



boards of county commissioners (except in certain incorporated cities with a special poor department), and may be provided for in the county almshouse.

3. **Commitment.**—(a) *Persons Committed.*—All insane persons, having a legal residence in the state, not idiots, imbeciles, harmless chronic dements, or cases of acute mania *a potu*, have the right of admission to the state hospitals. Non-residents who come into the state while insane may be committed for temporary care, as in the case of persons becoming insane while traveling in the state, or of sailors becoming insane upon the high seas.

(b) *Legal Procedure in Commitment.*—The superior court of any county, upon the application of any one under oath alleging that any person by reason of insanity is unsafe to be at large, must have such person before him, and summon witnesses and two reputable physicians before whom the judge must examine the charge, unless the accused or any one in his behalf demands that the question of insanity be decided by a jury. If no jury is demanded, and the physicians certify under oath that the person examined is insane, and the case is of a recent or curable character, or that the insane person is of a homicidal, suicidal, or incendiary disposition, or that he would be dangerous to his own life, or the lives and property of the community in which he may live, the judge must commit him to one of the hospitals for the insane if he believes that the proper facts of insanity have been established.

If it is necessary for want of room, or other cause, to discriminate in the general reception of patients, a selection may be made in the following order: (1) recent cases, when the disease is of less than one year's duration; (2) chronic cases, of more than one year's duration, presenting the most favorable prospects of recovery; (3) those for whom application has been longest on file, other things being equal. Where cases are equally meritorious in all other respects the indigent must be given the preference.

The relatives or friends of any person charged with insanity in all cases have the right to take charge of and keep him if they desire so to do; but the superior judge may require them to give a bond for his safekeeping.

Any person charged with insanity but not insane beyond all reasonable doubt may be committed by any judge of the superior court to the detention ward of a county hospital or other suitable place of detention for a period of thirty days. During this time the patient is under the observation of the county physician, who may obtain an extension of the time of observation for not more than another thirty days.

(c) *Voluntary Admission.*

(d) *Appeal from Commitment.*—Writs of habeas corpus may be granted for the protection of insane persons by the supreme court or superior court or by any judge of either court, and upon application the writ must be granted without delay.

(e) *Cost of Commitment.*—When a person is found to be insane, the costs of commitment must be paid by the county; but when the insane person is a resident of another county, the county in which proceedings were had may recover all costs and expenses from the county of which the insane person is a resident.

4. **Conveying Patients to the Hospital.**—When ordering an insane person sent to a hospital for the insane the superior court judge must direct the sheriff to notify the superintendent of the hospital, and transmit a copy of the complaint and commitment and physician's certificate, which must always be in the form as furnished to the courts by the board of control.

The state board of control has charge and supervision of the transportation of insane persons to the hospitals for the insane, and is vested with authority to employ necessary persons for such purpose.

5. **Transfer of Patients.**—Upon recommendation of the superintendent the state board of control may transfer a patient to another hospital. A certificate of the fact and the reasons therefor must be transmitted to the clerk of the committing court and the kin or friend of the patient.

6. **Parole and Discharge of Patients.**—Any patient so far recovered as to make it safe for him and the public to allow him to be at large may be paroled by the superintendent, and any patient becoming sane and probably free from the danger of relapse must be discharged. Indigent patients, when discharged, may be returned to the county from which admitted, at its expense. The superintendent must officially notify the proper superior judge, relatives, or friends of the discharge or death of any patient, and give the date and reasons for such discharge or death. Each indigent patient discharged must be furnished with suitable clothing and a sum of money not exceeding \$10.

Upon presentation of evidence that friends or relatives will be able to provide proper care for an insane patient, the superior court judge issuing the commitment may order his removal from the hospital to the custody of such relations or friends. If it is brought to the knowledge of the judge that the patient thus removed is not cared for properly, or is dangerous to persons or property, he may order him returned to the hospital.

7. **Cost of Maintenance.**—All patients in the state hospitals are supported by the state, and payment therefor is exacted from no one. Nor may donations be accepted by the hospitals with the understanding that they are in payment for the keep of any patient, although gifts may be received for the general support of the hospitals.

8. **Criminal Insane.**—The superior courts of the state have power to commit to the hospital for the insane any person who, upon being arraigned for an indictable offense, is found by the jury to be insane.

The prosecuting attorney of any county wherein a person may have been acquitted of a crime because of insanity may have him brought before the superior court of that county for trial by jury as to the question of his sanity. If the jury finds that the defendant

committed a crime, that he was acquitted because of insanity, and that he is insane and unsafe to be at large, he must be committed to the department for criminal insane. Either party may appeal to the supreme court as in other cases.

When any person committed as criminal insane claims to have recovered, he may apply to the physician in charge of the criminal insane for an examination. If the physician certifies to the warden that there is reasonable cause to believe that such person has become sane since his commitment and is a safe person to be at large, the warden must send him to prison and petition to the court that committed him, to discharge him. The prosecuting attorney of the county must resist the application at a trial by jury. Either party may appeal to the supreme court from the judgment discharging the petitioner or remitting him to custody. If the petitioner subsequently claims to have become a sane person, he may, upon a certificate of probable cause by the attending physician, again petition for discharge under the same proceedings. When a criminally insane person who has been discharged again becomes insane, the prosecuting attorney of the county from which he was committed may petition for his recommitment and trial by jury in regard to his mental condition.

Any person committed to the department for criminal insane must not be discharged from the custody of the warden, except upon the order of a court of competent jurisdiction made after a trial and judgment of discharge.

## WEST VIRGINIA

### Authorities:

Code of West Virginia, 1913

Laws of 1915

**1. Administration and Supervision.**—(a) *General.*—The state board of control is composed of three members chosen from the two largest political parties, not more than two of whom may belong to the dominant party, and appointed by the governor for terms of six years. Each member of the board receives a salary of \$5000 a year, and is obliged to give his entire time to the public institutions under its control.

The board has full power to manage, direct, control, and govern the hospitals for the insane, but the appointment of superintendents is vested in the governor. The board has the power to recommend to the governor the removal of any superintendent, and fixes the number of all subordinates and their compensation. The governor and state board each have authority to cause an expert inspection or investigation. The board reports biennially to the governor.

The state board must take steps to cause the deportation of any alien in the state hospitals and the return of a non-resident to his own state.

Biennially a joint committee of the legislature must investigate the condition of the hospitals for the insane and report upon it.

The state board has authority to issue permits for the establish-



ment of private hospitals for the insane, to investigate and inspect them, and revoke the permits after reasonable notice.

(b) *Institutional*.—There are no local boards of trustees. The superintendent and his medical assistants must be physicians and graduates from reputable medical colleges.

2. *Care*.—(a) *In State Institutions*.—Weston State Hospital, Weston; established 1858; 1050 beds.

Spencer State Hospital, Spencer; established 1893; 600 beds.

Huntington State Hospital, Huntington; established 1897; 650 beds.

(b) *In Local Institutions*.—An overseer of the poor is appointed by the county court for each magisterial district, and is responsible for the care of indigent persons who are not provided for in public institutions. Every county court may establish a county infirmary to which homeless indigent insane are admitted on the order of the overseer of the poor or the county court. The sheriff is permitted to hold in the county jail a violent insane person, provided that admission to a state hospital is refused.

3. *Commitment*.—(a) *Persons Committed*.—All persons who are residents of the state and have a legal settlement in any county are entitled to care and treatment in one of the state hospitals for the insane. Non-residents may, however, be admitted under contract with the board of control if there is a vacancy in any hospital. A non-resident so admitted may be discharged at any time to make room.

(b) *Legal Procedure in Commitment*.—Any resident of a county may complain to the clerk of the county court of any person suspected of being insane. The clerk must then issue a warrant on which the person is brought before the county commission of lunacy, composed of the president and clerk of the county court and the prosecuting attorney. They meet at the county-seat, unless it appears advisable to meet at or near the residence of the insane person.

The commission appoints a guardian *ad litem* to manage the case of the suspected person. Among the witnesses must be two physicians who must separately make a physical and mental examination of the patient and make out a verified certificate of their findings. If the commission decides that the person is insane, and ought to be confined in a hospital and ascertains that he is a citizen of the state, then, unless some person (to whom the commission in its discretion may deliver him) will give bond with sufficient surety to restrain and take proper care of him until he recovers, or he is delivered to the sheriff of the county, to be proceeded with according to law, the commission must order him to be removed to the nearest hospital. The interrogatories to the witnesses and the answers must be in writing, and, together with a written statement by the commission to the fact of insanity, must be transmitted with the order of commitment. Pending a vacancy at one of the hospitals, and until the superintendent removes him, the patient is delivered to the custody of the sheriff or some relative or friend, and may not be confined in any jail or lockup unless his condition is violent or dangerous. It is the duty of the superintendent of whom inquiry

has been made to cause the removal of the patient to the proper hospital without delay. Soon after the patient arrives at the hospital an examining board (the superintendent and assistant physicians) must be convened, and if they concur in opinion with the commission, must register him as a patient. If the examining board rejects the patient because in their opinion he is not insane the superintendent must return him by an attendant to the sheriff of the county, whereupon the commission of lunacy must promptly reconsider and dispose of the case.

If the commission find that the person suspected is insane, but a resident of another county, it transmits the evidence to the sheriff, who delivers the patient to his county of residence and proceedings are there taken for his commitment.

If some relative or friend will care for the patient the commission may take a bond of \$500 with condition that the insane person be restrained and properly cared for till the cause of confinement ceases or the patient is again delivered to the commission. If the person is found to be harmless and incurable he may be delivered to any relative or to a friend without bond.

When any person is confined in any jail as insane, the jailer must certify the fact to the circuit court of the county at the next ensuing term. The court must cause him to be examined by two competent physicians, and make such provision for his maintenance and care as his situation may require.

The allowance to the jailer shall not exceed \$1 a day except in extraordinary cases, and the jailer must apply once in ten days to a state hospital for the admission of a patient if the application is refused for the want of room. If a person residing in this state is suspected to be insane, the circuit court of the county of which he is an inhabitant must, on the application of any person interested and after five days' notice to the person so suspected, proceed to examine into his state of mind and, being satisfied that he is insane, appoint a committee for him. The same procedure is provided for in the case of a person residing out of the state, but having property therein, who is suspected of being insane.

(c) *Voluntary Admission*.—Any resident of the state in the early stages of insanity or believing himself about to become insane or believing that treatment in one of the state hospitals would be beneficial to him shall be received as a voluntary patient on a verified written application to the state board, which may require the certificate of one or more physicians or other evidence. A voluntary patient may leave the hospital on five days' notice if in the judgment of the superintendent he is in fit condition and may be discharged upon the certificate of the superintendent because cured or because further treatment is unnecessary.

(d) *Appeal from Commitment*.—The writ of habeas corpus must be granted by the circuit court to a person who by himself or by some one in his behalf applies by petition, showing evidence that he is de-

tained without lawful authority, or is wrongfully denied a certificate of restoration. The superintendent shall have five days' notice of the trial, and shall be represented by the attorney-general. In case the court finds the patient sane he shall receive a certified copy of the order made by the court.

(e) *Cost of Commitment.*—All expenses are paid out of the county treasury.

4. **Conveying Patients to the Hospital.**—The superintendent must be notified immediately by the clerk of the county court of any commitment, and if he considers the patient a proper one for admission and has room for him he sends an attendant at the expense of the hospital. If there is no room the superintendent notifies the board of control, which may cause the patient to be sent to another state hospital. Any relative or friend of the insane person may be allowed by the county commission of lunacy to deliver him to the hospital without expense to the county or state.

5. **Transfer of Patients.**—The board of control has authority to transfer patients from any institution under its management to any other institution of like nature.

6. **Parole and Discharge of Patients.**—When any patient in the state hospital is restored to sanity the superintendent gives him a certificate of restoration and discharges him. Any patient on parole or otherwise temporarily released may present himself to the superintendent for examination and discharge.

Except in the case of a person charged with or convicted of crime or confined in a state hospital or a private licensed hospital the commission of lunacy must make an inquest on application for discharge of any person confined as insane, and set him at liberty if they have authority to do so and find him restored to sanity.

The guardian or committee is entitled to the custody of a patient when he is not confined in a state hospital or jail.

The board of control may prescribe regulations regarding parole and discharge of patients.

7. **Cost of Maintenance.**—The expense of the maintenance and care of any insane person confined in a hospital must be paid out of the treasury of the hospital; and, if he is kept in jail the expense of maintenance and care must be paid out of the public treasury.

Any payments made from the county treasury may be recovered from the estate of the patient or his guardian, father, mother, husband, wife, or child.

8. **Criminal Insane.**—If any person charged with or convicted of crime is found to be insane, the court must order him to be confined in one of the hospitals for the insane as soon as there is a vacancy. When such a person is restored to sanity the board must give notice thereof to the clerk of the court by whose order he was confined, and deliver him in obedience to the proper precept.

If a person is found to be insane by the justice before whom he may be examined, or in a court in which he may be charged with crime,



the circuit court of the county of which he is an inhabitant must appoint a committee for him.

If a convict in a penitentiary becomes hopelessly insane, a justice must be notified, and if satisfied that the convict is insane and ought to be confined, must order him committed to a hospital for the insane, unless some person will give bond to restrain and take proper care of him until the cause ceases or the patient is delivered to the sheriff of the county. In case of recovery, the board of directors of the hospital must notify the clerk of the court by order of which patient was confined in the hospital.

## WISCONSIN

### Authorities:

Wisconsin Statutes, 1915

Laws of Wisconsin, 1917

1. **Administration and Supervision.**—(a) *General.*—The state board of control is composed of five members, one of whom must be a woman, appointed by the governor for terms of five years. The president receives \$3600 per annum, the other members \$2500 each per annum. The board has the entire management of all the state institutions. It is required to inspect each hospital at least once a month. The board acts as a commission in lunacy, with power to examine any person committed to any public or private hospital for the insane or who is restrained of his liberty by reason of alleged insanity at any place, and may order the discharge of any person who is not insane, except one held for trial on a criminal charge or confined by a court in a criminal proceeding. The board must each year file with the secretary of state a statement giving the name of every inmate in either of the state hospitals for whose support in whole or in part any county is legally chargeable, the length of time for which support is charged, and the amount due the hospital for the support of such inmate from a county. The board of control also has the duty of inspecting each county asylum at least once in three months, supervising and controlling the care of their patients, and examining plans and specifications for such asylums.

The governor must annually appoint a visiting committee of three, one from the members of the senate and two from the members of the assembly, to visit the state hospitals and report in writing to the governor.

(b) *Institutional.*—The board of control appoints for each hospital a superintendent, a matron, and a steward. It fixes the number of subordinate officers, and may remove any officer and employee for cause. All staple supplies for the state hospitals are purchased by the board, which also passes monthly in advance on all estimates for expenditures, and plans and supervises all improvements.

Each county asylum for the care of the chronic insane is governed by a board of three trustees, elected by the county board for terms of three years. The trustees are required to meet at least once in three months, and to make an annual report to the county clerk. In any

county maintaining both a poorhouse and a county asylum for the insane, the trustees of the latter are *ex-officio* superintendents of the poor, unless the county board orders otherwise. The board of trustees appoints a visiting physician and a superintendent of the county asylum. All other officers are appointed by the superintendent, subject to the approval of the board of trustees.

2. **Care.**—(a) *In State Institutions.*—Wisconsin State Hospital for the Insane, Mendota; established 1860; 650 beds.

Northern Hospital for the Insane, Winnebago; established 1873; 650 beds.

Milwaukee County Hospital for Mental Diseases, Wauwatosa; established 1880; 559 beds. (A semi-state institution.)

Central State Hospital for the Insane, Waupun; established 1909; 100 beds. (For the criminal insane.)

(b) *In Local Institutions.*—The chronic or incurable insane are provided for in the county asylums, of which there are thirty-five in the state; the largest is the Milwaukee County asylum at Wauwatosa, with a capacity of 835 beds. Any county board may, with the consent of the state board of control, establish an asylum for the care of the chronic insane. Plans of buildings must be approved by the state board of control. Two or more counties may unite in maintaining an asylum.

A county board may erect a hospital for insane patients who are affected by pulmonary tuberculosis in connection with a county asylum for the chronic insane, with the consent of the board of control.

3. **Commitment.**—(a) *Persons Committed.*—All insane residents of the state, not idiots, except those who are incurably insane, are entitled to admission to the state hospitals, or if from Milwaukee County to the hospital of that county. Chronic insane are admitted to the county asylums for this class.

Patients are admitted to the state hospitals from the several counties in the ratio of population, but each county is entitled to the admission of at least two if desired. An insane person whose residence cannot be ascertained must be received by the superintendent as a patient from the state at large, and not be charged to the county as one of the number to which it is entitled. But such person must be charged to the proper county when his residence is ascertained.

(b) *Legal Procedure in Commitment.*—Application may be made in behalf of a person supposed to be insane by any three respectable citizens to the judge of the county court for a judicial inquiry as to his mental condition, and for an order of commitment to some hospital or asylum for the insane. The judge must appoint two competent and disinterested physicians to examine the person. They must be graduates of a legally incorporated medical school or licensed to practise medicine in the state, and must have had at least two years' practice or one year's experience as physicians in an insane hospital, and be registered by the county judge as qualified. Before making an examination, which may be held in the presence of the judge, the physicians must, if it seems expedient, notify the person to be examined

that application has been made for an inquiry into his mental condition, but may withhold notice and the names of the applicants if it seems best, in which case they must state their reasons to the judge. The sworn report of the physicians must consist of answers to questions prescribed by law, and are to be made in each case, whether the question of insanity is tried before a jury or otherwise, and must be forwarded with the commitment papers to the hospital superintendent. If the notice provided for was not given to the person supposed to be insane, the judge may appoint a time and place for hearing the application, and must serve such notice. If notice is ordered, and no jury trial requested, the judge may proceed at the time and place specified in the notice, or if no notice is ordered then after receiving the report of the physicians, to make such further investigation of the case as may seem to him necessary. If satisfied that the person is insane, he may order his commitment to the hospital or asylum for the insane of the district to which the county belongs. If the judge thinks the interest of the person alleged to be insane requires it, he may appoint a guardian *ad litem*, the expenses to be paid by the county in which the proceedings were held. If demanded by the person alleged to be insane or by any one acting in his behalf before or after commitment, the judge must summon a jury to try the case in the presence of the person supposed to be insane and his counsel and immediate friends and the medical witnesses. All other persons are excluded.

If the jury or judge find that the person alleged to be insane is a fit subject to be sent to a hospital or asylum, the judge must order him committed to either state hospital. If he is a resident of a county having an asylum for the chronic insane, and the judge is satisfied that the insanity of the person has become chronic, he may commit him to such asylum.

A district court in any county, which is a court of record, has the same powers in respect to examination of persons alleged to be insane and their commitment as the county courts.

On receipt of an application for the commitment of a person alleged to be insane or the report of physicians, the judge may require the sheriff to confine him in some specified place until further proceedings can be had. The judge may also order the detention of any person whose sanity is being investigated for proper medical observation. But no person may be confined in a jail or other prison for confinement of criminals or any poorhouse, unless it appears to the judge that such confinement is essential to the safety of the person or that of the public, and the period of confinement must not exceed ten days, unless otherwise ordered by the judge. The county board of any county is authorized to provide suitable buildings for the purpose of temporary detention of the alleged insane.

(c) *Voluntary Admission*.—A person who may be insane or suffering from mental disorder may, upon his written application stating his mental condition, supported by the certificate of at least two physicians possessing the qualifications prescribed by law, based upon



personal examination of him, be admitted as a voluntary patient to any public hospital for the insane, in the discretion of the superintendent. A person, so admitted to either of the state hospitals, if not indigent, must pay such sum for his maintenance as the state board of control may direct, and no charge for his maintenance may be made against any county; if so admitted to any other public institution for the insane, if not indigent, the trustees thereof fix the compensation to be paid. Voluntary patients have the right to leave the hospital at any time if in the judgment of the superintendent they are in fit condition, on giving five days' notice of their desire to do so.

(d) *Appeal from Commitment.*—On his own verified petition or that of his guardian or some relative or friend, a person adjudged insane or detained as such, may have a re-trial or re-examination as to his sanity before the judge of the circuit court or county court or any other court of record in the county in which he resides or was adjudged insane. The judge receiving the petition must order two qualified physicians (Section 585) to examine him and report, fix the time and place of examination, and give reasonable notice to the guardian of the person to be examined, and to the superintendent of the hospital or asylum in which he may be detained, all of whom may appear and offer testimony at the examination. If the physicians report the person insane, and the judge is satisfied with the correctness of it, and no demand for a jury trial is made, a judgment to that effect must be entered. If the case is tried by jury and the jury disagree, it must be discharged and another jury may be impaneled. If the jury find the person sane, the judge must order his discharge, or if insane, order him returned to the hospital or the asylum where he may be detained; or if the person is on parole or leave of absence, he must be allowed to remain at large unless the judge is satisfied that it will be unsafe, in which case he may order his commitment to a hospital. In case no jury is demanded, the state board of control, acting as a commission in lunacy, may determine the sanity or insanity of a person committed to either of the state hospitals for the insane, whether he is an actual inmate thereof or at large on parole, or committed to any other hospital or asylum. Its determination has the same force as one made by a judge; or the board may, if it has reason to doubt the insanity of the person named, request the proper judge to make due inquiry. The foregoing provisions do not apply to any person awaiting trial on a charge of crime who is committed to any asylum or sentenced to confinement in the state prison or state reformatory, who has been lawfully adjudged insane and been transferred to either of those institutions or to any asylum, until the expiration of the term for which he was sentenced to imprisonment.

All persons confined in either state hospital, except those charged with or convicted of crime, are entitled to the benefit of the writ of habeas corpus, and the question of insanity must be determined by the court or judge issuing it. The decision that the person is insane

is no bar to the issuance of a writ a second time, if it is claimed that the person has been restored to reason.

(e) *Cost of Commitment*.—All expense of the proceedings, from the presentation of the application to the actual commitment or discharge of an insane person, whether he is a resident or non-resident of the county in which the proceedings are had, are paid by the county from which he is committed. If any county is chargeable with some portion of the expense of maintaining the person committed, the county must pay the expense of the commitment.

If the insane person is a resident of any other county in the state than the one from which he was committed, the county in which he resides must reimburse the county from which he was committed all expenses of the examination and commitment.

4. *Conveying Patients to the Hospital*.—The warrant of the court to take a person to a hospital may be executed by a relative or friend of the patient if competent, otherwise by the sheriff. Every female over ten years of age must be accompanied by a competent female attendant.

5. *Transfer of Patients*.—All inmates of the state institutions for the insane belonging to the county and held as chronic or incurable may be transferred to county asylums, as well as all other persons belonging to or residing in the county, who have been adjudged insane, and may be properly confined in such an asylum. Whenever any insane person committed to any asylum is found to be acutely insane, and to require permanent or special treatment, he may be transferred to one of the state hospitals, and committed to it.

The board of control may transfer patients from one hospital or asylum to another; and, if to the benefit of the patients in either of the state hospitals, may remove therefrom any chronic insane person not chargeable to any county to some county asylum.

6. *Parole and Discharge of Patients*.—The superintendents of the state hospitals and of the Milwaukee County hospital may permit any inmate to go at large on parole, when, in their opinion, it is safe and proper to do so. If, within two years it becomes unsafe to allow such person to remain at large any longer, the superintendent must require his return to the hospital, unless he has been adjudged sane by competent authority. At the expiration of two years, the presumption of insanity against such person ceases, and until a new adjudication to the contrary, it must be regarded as though his sanity had been established by a judicial examination.

The superintendent of any county asylum may, upon the written recommendation of the visiting physician, permit any of its inmates leave of absence for such time and under such conditions as he may direct.

Incurable and harmless patients must be discharged whenever it is necessary to make room for recent or more hopeful cases, as may be ordered by the state board of control.

If the relatives or friends of any patient ask his discharge, except

the criminal insane, before such person has recovered from insanity, the state board of control may require a bond, conditioned for his safe-keeping.

**7. Cost of Maintenance.**—All insane persons residents of the state admitted to state hospitals are maintained at the expense of the state; but the county in which the patient resided before being brought to the hospital must pay for all necessary clothing and a fixed sum per week for the patient's support. Relatives, friends, or guardians of a patient may pay for his maintenance and provide him with special care or special attendants upon payment in advance of the expenses. When neither the state nor the county is properly accountable for the support of a patient in either hospital, the state board of control must ascertain the residence of the patient and secure his removal to it, if practicable, provided it can be done at a cost not exceeding \$100.

Each county caring for its own chronic insane in an asylum is entitled to receive a stated sum per week for each person cared for. But no county is entitled to any compensation for the care of any person who has not been adjudged insane and properly committed, nor for the care of any insane person whose support is not properly a public charge.

In no case may payment be made by the state toward the maintenance of a patient in a county asylum until the expiration of five days after the state board of control has received copies of the commitment papers together with a certificate of the judge stating the reasons for sending such persons to the county asylum instead of to the hospital.

The property and estate of any insane patient in a state hospital or county asylum, or kept by any county at its charge, and of a deceased patient of a hospital or asylum, are liable for his continuing and past support and maintenance; and upon failure of the person having custody of such property or estate to pay for the support of the patient, the state board of control, the board of trustees of the asylum, or the board of the county furnishing the patient's support may apply to the proper county judge to compel payment.

When a person is brought before the county judge for examination for whose support, in whole or in part, any county may be chargeable, he must give due notice of the hearing to the district attorney of the county supposed to be chargeable and must take testimony showing the actual and legal residence of such person, his general financial ability, and in case the testimony does not disclose property sufficient to save the county from the expense of his support, then the general financial ability and residence of any person chargeable with his support.

**8. Criminal Insane.**—The courts of record in the state may commit for safe-keeping or treatment to the hospitals for the insane any person charged with or convicted of any crime punishable by confinement in the state prison, and awaiting hearing, trial, conviction, or sentence on account of the alleged insanity at the time of the commission of such crime or at any time afterward and prior to sentence.



When any person is indicted or informed against for any offense and it is claimed before trial that he at the time of the commission of the offense was insane and not responsible for his acts, the court must order the question tried and determined by the jury. If the jury finds that the person was insane or that there was reasonable doubt of his sanity at the time of the commission of the alleged offense, they must return a verdict of not guilty because insane. The court must thereupon commit him to one of the state hospitals for the insane, to be detained and treated until he can be discharged according to law. A re-examination of his sanity may be had as in the case of other patients, but no person thus committed may be discharged unless the magistrate or the jury passing upon his sanity, in addition to finding him sane, also find that he is not likely to have such a recurrence of insanity as would result in acts which, but for insanity, would constitute crimes.

The board of control, acting as a commission in lunacy, may adjudge any prisoner in the state prison, in any county jail, or in the Milwaukee house of correction to be insane and may, with the approval of the governor, remove him to the state hospital for the criminal insane. If a prisoner thus removed recovers his reason before the expiration of his sentence, he must, by order of the board, be returned to the prison from whence he was taken.

## WYOMING

### Authority:

Compiled Statutes of Wyoming, 1910

**1. Administration and Supervision.**—(a) *General.*—The state board of charities and reform is composed of the governor, the secretary of state, the state treasurer, the state auditor, and the state superintendent of public instruction. The board has general supervision and control of all state charitable, reformatory, and penal institutions. One or more of the members must personally inspect all state institution buildings at least once every year.

The board directs the general management of the state institutions, is responsible for the proper disbursement of all funds appropriated for their maintenance, appoints all the officers, and prescribes their duties and compensation.

The secretary of the board makes a biennial report to the governor.

(b) *Institutional.*—There is no local board of trustees. The superintendent of the hospital for the insane, appointed by the state board and subject to removal by it, must be a graduate in medicine, and must keep a full account of all his doings, and of the operations of the institution, submitting a monthly report to the state board. He employs all necessary help needed at the hospital, subject to the approval of the state board.

**2. Care.**—(a) *In State Institutions.*—Wyoming State Hospital for the Insane, Evanston; established 1889; 225 beds.

**3. Commitment.**—(a) *Persons Committed.*—Residents of the state

who become insane are entitled to admission to the state hospital. Insane persons who have not acquired a legal residence must be returned by the state board of charities and reform, with the consent of the governor, either before or after admission to the state hospital, to the place of their residence, at the expense of the county from which they were committed.

Patients, whose friends will pay for them, or who have property to pay their expenses, are admitted to the state hospital on terms prescribed by the state board.

(b) *Legal Procedure in Commitment.*—Upon verified petition in prescribed form of any relative or friend or other person to the district court or a judge thereof, that a person is insane, or incompetent to manage his property, the court must notify the supposed insane or incompetent person of the time and place of hearing the case and require his presence.

The determination of the insanity or incompetency of any person is by a jury of six men and is conducted as a civil action.

If the jury returns a verdict that the person tried is insane, the county physician, or some reputable physician appointed by the court, must furnish a lunacy statement in prescribed form, containing answers to the questions prescribed, and must return it to the clerk of the district court, within three days after the finding of the jury in such proceedings.

The jury, in addition to finding upon the question of the sanity of a person, must find the value of his estate, if any, or whether he is a pauper. If he has estate, the judge, commissioner, or clerk presiding over the proceedings must appoint a guardian to take charge of his estate in the manner provided in relation to guardianship.

The committing judge must, in addition to the order of commitment and the statement in lunacy, issue a certificate showing the name, age, sex, nativity, and occupation of the person committed and his place of residence. The clerk of the court must send a certified copy of the verdict and the physician's lunacy statement, together with the commitment warrant to the superintendent of the hospital at the time of commitment.

If the insane person sent to the hospital is a pauper, the clerk of the court must provide him with the necessary clothing at the county's expense.

(c) *Voluntary Admission.*

(d) *Appeal from Commitment.*—Persons restrained of their liberty are entitled to the writ of habeas corpus, upon sworn petition to the supreme or district court, or by any judge of either of those courts.

(e) *Cost of Commitment.*—The expense of the proceedings to determine the question of a person's insanity is a charge against his estate. If he has none, the expense is borne by the county in which the proceeding is had. If the jury declares the person to be sane, then the one making the complaint, except a county officer, must pay the expense of the proceeding.

The state pays all expenses of returning recovered patients, and of patients found not to be insane, to their respective homes or the county from which they were committed.

4. **Conveying Patients to the Hospital.**—The superintendent of the hospital for the insane when notified by the county clerk must, under rules provided by the state board, have the insane person conducted to the hospital at the expense of the state.

5. **Transfer of Patients.** 6. **Parole and Discharge of Patients.** 7. **Cost of Maintenance.**—Insane poor persons are supported at the hospital by the state. The guardian of an insane person admitted to the hospital must pay for his support out of the estate of such ward.

Appropriations out of the county treasury for the care of any insane person may be recovered from any person who is bound to provide for an insane person, if he has sufficient ability to pay.

8. **Criminal Insane.**—The state board of charities and reform must provide for the care and custody of all persons declared insane after legal inquiry has been made who are accused of, or convicted of crime, at the state hospital, or at a private institution within or without the state.

When a person accused of or convicted of crime, who is confined in any penitentiary, county jail, or other place of confinement, awaiting trial, or on sentence, is of unsound mind, the officer having him in charge must, and any citizen of the state may, make complaint, and the question of the sanity of the person must be tried and determined as provided by law in the case of other persons of unsound mind.

If found insane, such person must at once be taken to the place of treatment prescribed by the state board.

When a criminal insane person recovers his reason, he must be returned to the penitentiary, the county jail, or other place of imprisonment where he was previously confined, to serve out the remaining term of imprisonment if any.



# THE LEGAL ASPECTS OF PREGNANCY

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It is exceedingly important that the medicolegal expert be well versed in the clinical signs and manifestations of the various stages of pregnancy, since it is not at all infrequent for the question of gestation or the effects of child-bearing to arise in a certain class of cases. Thus, in civil law a physician may be called upon to testify as to the virginity of a woman or the purity of a divorced wife libelously accused of gestation, as proved, negatively, by the absence of the signs of pregnancy or of parturition; he may be required to show the absence of pregnancy in cases of feigned gestation, or when a woman claims to be with child by a man recently dead, for the purpose of advancing an additional heir to a disputed title or estate, or for the purpose of substituting a child in place of the legitimate heir. The claim of pregnancy may be made in order to institute blackmail; it may be advanced as a plea to prevent attendance upon the witness-stand in an important trial by jury; it not infrequently is employed as a means of enforcing marriage to satisfy feelings of unrequited love or to establish a claim for financial support. It has been used as a means of holding the affections of an estranged husband desirous of offspring.

In the criminal court instances are recorded of women pleading pregnancy to bar execution. From the time of the old Roman law to the present such a claim, if verified, has been ample to postpone the carrying out of the sentence of capital punishment until the birth of the child is accomplished. In all such cases, under writ of *de ventre inspicendo*, proof of the supposed condition is required, and is secured by careful investigation by medical experts or by the physician appointed by the court. These have rightfully supplanted the old English jury of twelve matrons who were summoned to ascertain the unfortunate woman's condition, and whose main duty was to determine whether or not the woman was quick with child. If the woman is acting *bona fide*, the examination will not be refused; indeed, it will probably be insisted upon by her. Refusal to permit the examination will expose her to the strong suspicion of unfair dealing. The practitioner must remember, however, that he becomes liable to legal action on her part if he force an examination against her will. It should be his duty, likewise, to warn the patient in all cases that any suspicious appearance may be used as valuable evidence against her. Again, the existence of pregnancy may be denied strenuously by a woman in order to avoid the stigma of illegitimacy, or to gain time for the induction of an abortion.

Here the effort of the physician should be to demonstrate the presence of the gestational signs.

It is important to note that a positive diagnosis of pregnancy is impossible before the sixth week, and often not until the second menstrual epoch, especially in multiparous women. After the date of the positive signs no difficulty should be experienced in proving or disproving the existence of pregnancy. Hence the examination should be postponed, if possible, until such a time as will elicit positive results. An error in diagnosis, whereby an innocent woman is erroneously declared by the examining physician to be pregnant, will react disastrously upon the so-called expert, and may prove ample ground for the institution of legal proceedings.

It is patent, therefore, that a knowledge of the signs of pregnancy is essential for a positive affirmation or denial in a given case.

### THE SIGNS OF PREGNANCY

It is customary to group the signs of pregnancy broadly under the two headings of *subjective* and *objective*, of which the latter only—those detected by the senses of the examining physician—are to be trusted implicitly, since they alone are capable of demonstration. While the subjective signs, when present, are exceedingly valuable as suggestive of pregnancy, it must be remembered that a woman may be voluntarily deceiving her physician, or that she may be herself deceived, as has been frequently noted in remarkable instances in the history of obstetrics. Thus, a woman nearing her menopause and married late in life, or sterile since an early marriage, may readily coax herself into believing that the menstrual suppression characteristic of the so-called “lodging-period” of the climacteric is due to an incipient gestation. Once firmly fixed in her mind, this belief can grow *pari passu* with the supposed advancing pregnancy. The same condition may develop in a woman not pregnant, but who has indulged in illicit intercourse and fears the result. Intestinal movements will be interpreted as fetal motions; gaseous distention of the bowels and fat accumulations in the abdominal walls are the progressively enlarging uterine body; the irritable bladder of elderly women is construed to mean the irritable bladder of uterine pressure; the breasts may be found to secrete a small amount of serous fluid, and the woman and her husband, and even the family doctor himself, may be deceived into believing that pregnancy exists. In other words, a typical *pseudocyesis* or *phantom pregnancy* is developing.

Let it be noted here that pseudocyesis, with the one exception of abdominal enlargement, is a subjective consciousness entirely. The woman feels the sensation of quickening, the fetal movements, the pressure upon the bladder, the sympathetic breasts. The diagnosis of her true condition can be made by the skilled obstetrician only by giving attention to the following points: The woman's age—she is approaching the menopausal period when menstrual suppression or irregularity is the rule, and nervous manifestations are frequently exaggerated;

abdominal palpation and percussion will reveal a heavy accumulation of fat in, together with a lax and pendulous condition of, the walls, and a highly resonant or tympanitic note over the entire surface; no fetal outlines can be detected by palpation of the abdominal surface; examination of the vulvar orifice and vagina reveals the senile atrophy and probably the beginning yellow discoloration of the mucous membrane that are characteristic of advancing years; the vagina may be more or less contracted, the cervix senile and atrophic, and the uterine body small and undergoing retrograde changes; the appendages are also small and detected with difficulty. In order to avoid any error in diagnosis it is better in these cases to administer chloroform, ether, or gas, when the abdominal enlargement will collapse and the true condition be made patent. Frequently, when the true condition is revealed to the patient she rapidly returns to the normal status. In a few instances the obsession will remain, and the patient passes over into the group of the insane. These cases of genuine pseudocyesis may be much more difficult to diagnosticate than feigned pregnancy in hysteric women (see Feigned Pregnancy, p. 944).

It is well, then, to note that a pregnancy may be *presumptive*, it may be *probable*, or it may be *certain*. It is presumptive when, without any expert investigation, the woman, having been exposed, legitimately or illegitimately, to the possibility of conception, presents some or all of the subjective signs of pregnancy, together with a minor degree of abdominal enlargement. It is probable if these signs steadily increase in intensity and other signs develop at proper periods, which in a typical case of gestation should be superadded to the initial symptoms. Finally, a pregnancy is certain only when there are present the so-called positive or diagnostic signs of pregnancy, variously estimated as from three to five in number. They include the fetal heart sounds, the fetal movements, ballottement, vaginal and vulvar discoloration, and intermittent uterine contractions.

For convenience of reference the signs of pregnancy may be grouped under four headings: namely, the uterine, the vaginal, the abdominal, and the general.

### THE UTERINE SIGNS

**Cessation of Menstruation.**—This is probably the most valuable of the subjective signs of pregnancy. If the previous history has been one of regularity, greater value is to be attributed to the irregularity or suppression of the function, especially if this be associated with other suspicious circumstances, as the history of sexual intercourse. It is the result usually of gestation, although it may follow other pathologic causes, or it may be absent altogether, and the woman menstruate regularly throughout the first trimester or even the full period of pregnancy. Other remarkable cases are those in which the normal (?) condition of the woman is that of amenorrhea, save during the progress of gestation, when regular menstrual discharges prevail. Again, it is possible for pregnancy to occur in young girls prior to the establishment



of the menstrual flow, and for rapid successive pregnancies to prevent the appearance of the menses until late in the woman's life, or even altogether. Again, cases are on record of conception having occurred some time after the woman had passed through her climacteric. These instances all go to prove that ovulation, the essential feminine process in conception, is not at all dependent upon menstruation, although it is probable that each menstrual epoch is associated with the escape of an ovum either at its height, shortly before, or shortly after its appearance. In other words, it is not necessary for a menstrual discharge to accompany each escape of an ovum.

Leopold and Mironoff<sup>1</sup> find that menstruation is usually accompanied by ovulation, but not rarely is unattended by ovulation. It is not dependent upon the maturation and rupture of a Graafian follicle, but the presence of the ovary and a sufficient development of the uterine mucosa are necessary. It is now known that both phenomena of ovulation and menstruation result from a stimulation arising from the presence of the hormones of the corpus luteum. Ovulation is connected with menstruation in so far as it requires for its occurrence a congestion of the sexual organ lasting several days. Ovulation occurs independently of the time of menstruation, but under physiologic conditions, rarely. Usually menstruation occurs with ovulation; less frequently it may occur without ovulation; and least frequently ovulation may occur without any sign of blood at a regular menstrual period, as when pregnancy occurs during the menstrual suppression of a normal lactation.

To complicate matters still further, there may be total absence of menstruation, the result of occlusion of some portion of the lower birth canal (atresia of the cervix uteri, vagina, or vulva; imperforate hymen), with a vast accumulation of the fluid and great distention of the uterine and abdominal cavities, thus closely simulating an advanced pregnancy, with total suppression of menstruation. The persistence of menstruation during the first trimester of pregnancy, in addition to confounding the diagnosis, will be a confusing element in the determination of the duration of a given case.

The morbid conditions that are frequently associated with menstrual suppression without coincident gestation, and which are frequently overlooked by the examining physician, are incipient phthisis, chlorosis, anemia, hemorrhage from wounds or other mucous surfaces (**vicarious menstruation**), various forms of insanity, hysteria, sudden and decided change of climate, and the development of certain pelvic tumors, as ovarian cysts, and occasionally uterine myomata. An important fact worth noting is that the menstrual suppression of pregnancy is generally associated with a steady improvement in the body-health, which is not true of the foregoing conditions. Anxiety, as after illicit intercourse, may temporarily cause menstrual suppression.

**Feigned Menstruation.**—Occasionally women will feign menstruation in order to conceal an illegitimate pregnancy. This is ac-

<sup>1</sup> Arch. f. Gyn., Bd. xlv, H. 31.

complicated by staining the underclothing and napkins with other mammalian blood, which is not readily distinguishable from the menstrual flow; or even, as has been noted, with preserved menstrual blood. In the former case microscopic examination will generally show the absence of the typical vaginal epithelium, and such blood is much more predisposed to coagulation than are the true menstrual blood and acid vaginal discharge.

**Progressive Increase in the Size of the Uterine Body.**—This is a fairly presumptive sign of pregnancy after the first trimester,



FIG. 222.—Abdominal enlargement of the sixth month of pregnancy, showing position of the fundus of the uterus at different weeks of gestation.

although not an infallible one. The tumor of pregnancy, at first ovoid in shape, becomes progressively more and more pear shaped, occupies a median position with a slight inclination to the right and a decided tendency to ante flexion, is smooth in contour and of a soft and elastic consistency, and is freely movable. It is of rapid growth, occupying fixed positions at certain periods of gestation (Fig. 222). Thus, at the second month, the fundus is about on a level with the top of the symphysis pubis; at the fourth month it is midway between this point and the umbilicus; at the sixth month it is at the umbilicus; at the seventh

month it is midway between the umbilicus and the xiphoid cartilage; and at the ninth month it has fallen about one inch. The percussion note over the uterine body is dull, due to the upward and backward displacement of the bowels. Other conditions that may simulate such a tumor at an early or later period are a subinvolved uterus, retained menses forming a hematometra, a non-nodulated fibrous or myomatous tumor, gaseous distention of the bowel, ascites, an ovarian cyst centrally situated, and tumefactions of the abdominal organs, as the liver and spleen. It is very important that an error be not made in this diagnosis, since many a woman has had her life embittered and the physician his professional reputation injured by such a mistake. Legal action can readily be grounded upon such an error. Intestinal flatus will be detected by the percussion note; ascites and ovarian cyst, by variation in the area of dulness and the elicitation of fluctuation; the absence of correlated signs of pregnancy will distinguish other growths, while the uterine contractions may be noted in true pregnancy when the cold hand is laid upon the surface of the abdomen. Etherization in doubtful cases will be imperative.

**Braun-Fernwald's Sign.**—An occasional asymmetry of the uterus will be noted in pregnancy, the unequal development of the two sides of the uterine body being separated by a distinct longitudinal furrow.

**Braxton Hick's Sign.**—Intermittent uterine contractions capable of recognition after the third month of gestation must be regarded as an exceedingly valuable proof of gestation. No other known tumor than a uterine growth will present this phenomenon. At regular intervals from the beginning of the fourth to the tenth month of gestation, varying from five to twenty minutes, the uterine tumor will harden and remain contracted for the space of from three-fourths to five minutes. This process is absolutely painless and is not recognized by the woman herself. The mere grasping of the uterus may cause it to appear. It is never absent in pregnancy, whether the fetus is living or dead. It is not peculiar to pregnancy, however, but may be present in cystic distention of the uterus (hematometra, pyometra) in large, soft uterine myomata, or when there is a very large intra-uterine polypoid growth. The sign may be simulated by the contractions occurring in an over-distended bladder, though this is rare. It is interesting to note that a sympathetic uterine contraction may occur in advanced ectopic gestation.

**The Uterine Souffle or Placental Bruit.**—This is a very constant but non-diagnostic sign of pregnancy, since it may occasionally be detected in other uterine and ovarian tumors or conditions of marked pelvic congestion. It is a rhythmic blowing sound occurring synchronously with the woman's heart-beat, commencing about the tenth week of gestation, and persistent throughout; it is situated low down and to one or the other side of the uterine tumor. It is produced by the rush of blood through the enlarged uterine arteries, and is generally most prominent in anemic individuals. It must not be mistaken for a similar sound, known as the **cardiac souffle**, which is produced by the passage of the blood through the foramen ovale.



The **funic** or **umbilical souffle** is a high-pitched, whistling sound synchronous with the fetal heart-beat, and heard best, although even then with difficulty, over the fetal chest. It is produced by tension of the cord with stenosis of its vessels, and has but slight value as a diagnostic sign of pregnancy. It is claimed that it is more readily heard when the cord is wrapped around the fetal body.

**Irritability of the bladder** is produced early in gestation, and in the closing month by direct pressure of the uterine body upon the base of the bladder. It is, in primiparous women, a sign of much value, especially if it be associated with a history of coitus and of menstrual suppression. It is by no means diagnostic.

### VAGINAL SIGNS

**Jacquemin's or Chadwick's Sign.**—A bluish or purplish discoloration of the vagina is almost a positive sign of pregnancy. In many cases of gestation I have never failed to find it present, and in some thousands of gynecologic cases I have not seen it accompanying any other condition than pregnancy. Jacquemin originally declared it to be a certain sign in women who have no hemorrhoids, and this statement has been confirmed by many obstetricians. It may be recognized as early as the fourth week, though it is often not well marked until the third month. Dependent as it is upon the pelvic congestion, it must increase in intensity *pari passu* with the advancing pregnancy. Toward the close of gestation the mucous surface of the vulva may be almost black in color. In the earlier weeks the discoloration may be first noticed beneath the urethral orifice, digital compression showing the sluggishness of the circulation. It becomes very pronounced upon the inner surfaces of the labia majora and over the vestibule. It is claimed that certain neoplasms may produce such a discoloration, but this must be quite exceptional. This sign may be absent entirely throughout a gestation, but the absence of the discoloration cannot be construed as an argument against the existence of pregnancy; its presence is practically diagnostic.

The **vaginal pulse** is a frequent sign, and valuable as a presumptive symptom of early gestation. It consists in a distinct pulsation of the vaginal arteries consequent upon the high arterial tension of the pelvis. It is not invariably present, and may accompany other conditions, as fibroid tumors, extra-uterine fetation, and inflammatory pelvic conditions. Flattening of the anterior vaginal vault may likewise be noted, and was regarded by Barnes as strongly suggestive of pregnancy. It results from backward traction by the upward tilted cervix.

**Leukorrhea** is of no special value as a means of diagnosis, even though the woman has never suffered from it prior to the supposed gestation. It is always present to a certain degree, but may be due to many other conditions. It is associated with more or less puffiness of the vaginal walls and vulvar tissues, and is directly dependent upon the increased pelvic congestion.

**Softening of the cervix (Goodell's sign)** is a very suggestive symptom, especially in primiparous women. It is due to edema of the cervical tissues beginning around the os uteri, and is present as early as the second or the third week of pregnancy. As formulated by Goodell, the rule of practice is as follows: If the cervix be as hard as the tip of the nose, pregnancy presumably does not exist, but if it be as soft as the lips, the existence of gestation is probable. It is accompanied by a considerable degree of dilatability of the cervix, especially in multiparous women. The same softening may be noted in certain pelvic inflammatory conditions, at the menstrual epochs, and accompanying the growth of soft myomata. If the cervix is the seat of extensive scar-formation due to old lacerations, or if it contains fibroid nodules the softening will not occur during pregnancy. After the fifth month the cervix will also be found to have shortened materially, and the external os points more toward the sacral hollow. By term the cervix has become fully obliterated, the internal os, however, remaining closed until labor begins.



FIG. 223.—Method of eliciting Hegar's sign of pregnancy (Sonntag).

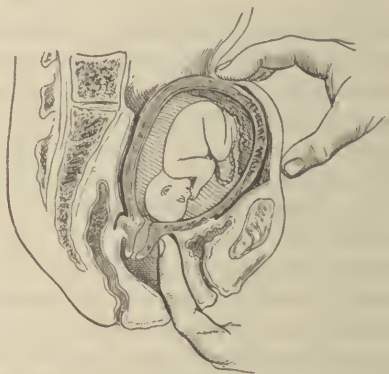


FIG. 224.—Vaginal ballottement.

**Hegar's sign**, or softening and compressibility of the lower uterine segment, is regarded by many as almost diagnostic of early pregnancy. Soft uterine myomata, however, may occasionally produce such softening of this lower segment as closely to simulate the gestation sign. Bimanual palpation is necessary to elicit the change, the right hand resting upon the abdomen just above the symphysis, while the thumb of the left hand enters the anterior vaginal fornix and the index-finger passes far up the rectum (Fig. 223); approximation of the thumb and finger below while the uterus is depressed by the external hand will reveal the undue softening of the uterine tissues. Between the second and fifth months of gestation Hegar's sign may be regarded as one of great value. Anesthesia may be required in order to detect it in some cases, and in a large number of cases it cannot be elicited.

In **vaginal ballottement**, or the balancing of the fetus between the fingers, we have an absolutely diagnostic sign of pregnancy, which,

however, is available only from the middle of the fourth to the eighth month. It is elicited by allowing the woman to stand, or by placing her upon her back with the abdominal muscles partially relaxed and the shoulders elevated. The index- and middle fingers of the left hand are introduced into the anterior vaginal fornix, while the fundus is steadied by the right hand placed on the abdominal surface (Fig. 224). The fingers in the vagina then give a sudden impulse to the anterior uterine wall, when the fetus, which is displaced upward in the liquor amnii, impinges upon the abdominal hand and gently falls again upon the vaginal fingers. A double thumping is thus noted. There is no other condition that could possibly produce a similar sensation, although some claim that an extra-uterine polypus with a long pedicle or a pedunculated ovarian cyst will respond to the test. It is not always present, however, being absent in twin pregnancy, in absence or deficiency of the liquor amnii, and in placenta prævia.

**Uterine fluctuation** is considered by Rasch as an important sign of early pregnancy, recognizable from the second month. It is elicited by placing two fingers of the left hand in the anterior vaginal fornix and steadying the fundus by the right hand placed on the abdominal wall. Gentle tapping by the external fingers will transmit a wave to the vaginal fingers through the agency of the liquor amnii.

**Varicosities** in the vaginal wall and around the vulvar orifice are indicative of pelvic congestion and are usually most prominent in the congestion of pregnancy, because of the additional mechanical factor—pressure by the gravid uterus upon the pelvic veins. In association with other signs of the advancing gestation it possesses some significance.

An absolutely diagnostic symptom is the detection, by the vaginal finger, of the fetal parts.

## ABDOMINAL SIGNS

**Cutaneous discoloration of the abdomen** is present in the vast majority of pregnant women. The line of discoloration—*linea fusca* or *nigra*, the yellow, brown, or black line—supplants the *linea alba*, and may extend as far as the xiphoid cartilage. It is most marked in brunettes, and may be altogether absent in blondes. It is by no means diagnostic, however, as boys and unimpregnated girls may present the *linea fusca*. The *linea alba* also darkens at the menstrual epochs and in certain forms of pelvic disease, as ovarian cystoma and uterine myoma.

**Progressive enlargement and protrusion of the abdomen** is an essential sign of pregnancy, but it is patent that the same symptom must occur whatever be the nature of the intra-abdominal growth. The protrusion in pregnancy first becomes evident about the fourth month, and is most marked in women of small stature. The enlargement is symmetric, centrally located, and cystic to the feel save where the fetal parts may be detected. The same errors of fallacy are to be noted as in the case of uterine enlargement.



The **striæ** are the purplish lines of discoloration that appear on the distending abdomen in the iliac region and toward the flanks (Fig. 225). They are not diagnostic of pregnancy, but may result from any excessive distention of the abdominal walls, as from cysts or ascites.

A change in the **condition of the umbilicus** is noted in pregnancy, and while this alteration may result from other causes of distention, it is most commonly associated with gestation. At the sixth month the umbilical depression is obliterated, and after that date there is a progressively increasing protrusion to term. It is frequently surrounded by a pigmented area.

The **percussion note** over the growing uterus is flat, while to the sides and above there will be found an area of tympany known as the "coronal resonance." Any solid or fluid tumor, however, will give the same result; hence it is not characteristic. Very rarely, in the presence of excessive intestinal tympany, the area of uterine dulness will be concealed.

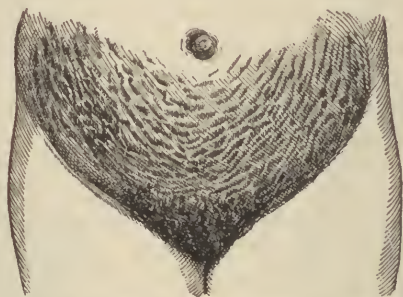


FIG. 225.—Striæ, or lines albicantes (Auvard).

**Abdominal ballottement** is an absolute sign of pregnancy, elicited by steadying the uterus with a hand placed on each side of the abdomen. An impulse given by one hand will cause the fetus to impinge upon the opposite hand; the shock is more distinct when the fetus is small and undersized.

All women are essentially **constipated**, but in pregnancy this may become an exceedingly prominent symptom. This results from the stagnation of the pelvic circulation, and is accentuated by direct mechanical pressure of the enlarged uterus upon the lower bowel. It is of value as a diagnostic means only when taken in connection with the other symptoms of early pregnancy.

**Quickening and Fetal Movements.**—By quickening is meant the first fetal movements appreciated by the mother. It usually occurs about the middle of the fifth month of gestation, but may be felt as early as the third month (twelfth week). It is peristaltic in nature, and when noticed, the woman is said to be "quick with child." All subsequent sensations of fetal life are designated as **fetal movements**, and they constitute an absolute sign of pregnancy. They are not invariably present, however; hence their absence does not indicate the absence of gestation. It is likewise possible for the woman to mistake intestinal

peristalsis and choreic movements of the abdominal muscles for the sensation of quickening. The use of the stethoscope or of an anesthetic will demonstrate this condition. Active fetal movements can rarely be appreciated by the physician before the middle of the sixth month. The placing of the cold wet hand on the abdomen will sometimes cause an exaggeration of their intensity. Once detected, they steadily grow stronger with the advancing weeks. They appear either as distinct blows, as from the spasmodic movements of a fetal limb, or as a peculiar undulating movement, advancing across one side of the abdomen as the swell of a wave; this is produced by a straightening of the fetal ellipse, the back coming in contact with the uterine and abdominal walls. These movements may be absent throughout pregnancy, and the woman be delivered of a living fetus, as when there is an excess of

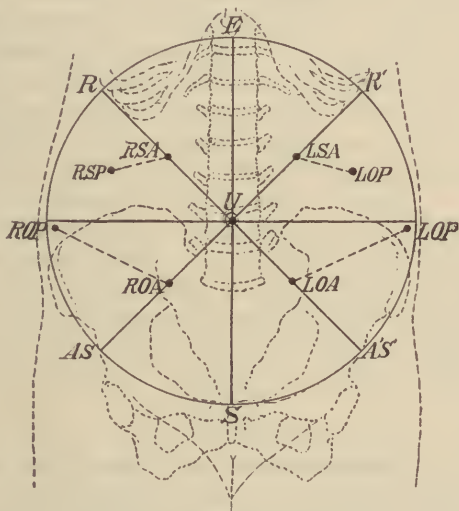


FIG. 226.—Diagram illustrating the points of maximum intensity of the fetal heart sounds in vertex and breech presentations.

liquor amnii; or they may be suppressed for variable periods only. Several examinations should be insisted upon before the positive absence of movements is asserted. The fetal movements can frequently be seen as well as felt by the hand. At times the movements of the fetal limbs in the liquor amnii or in contact with the uterine wall will produce faint indescribable sounds, which, if distinctly heard, are characteristic of pregnancy. It is exceptional, however, for this sound, termed the **fetal shock**, to be heard. When present, it is usually preceded by a churning sound known as the **fetal bruit**.

The **fetal heart sounds** (Mayor's sign) constitute an absolute and unmistakable sign of pregnancy. They may be detected as early as the third month, although usually not until the fifth month; from this time they grow steadily in intensity as the fetus develops. They simulate the muffled ticking of a watch placed under a pillow. The rate is about

twice that of the maternal heart-beat, or from 120 to 160 beats a minute. This sign may be absent or indistinguishable in women with very fat abdominal walls, in hydramnion, when there is an excessive amount of flatus in the intestines, or when the fetal back is directed posteriorly, the sounds being most distinct over the dorsum of the fetus. Commonly they are best heard at a point below the level of the umbilicus, and to the right or left, according to the position of the fetal back (Fig. 226). In breech presentations the point of maximum intensity of the sound is above the umbilicus and to the right or left side of the abdomen.

### GENERAL SYMPTOMS

Certain **urinary changes** are noted in gestation, none of which, however, is of positive diagnostic value. Frequency of micturition and vesical irritability are common, and are valuable presumptive signs of early gestation if taken in connection with menstrual suppression and moderate uterine enlargement. The presence of **kiestein**, or the formation of a fatty pellicle upon the urine which has been allowed to stand for some hours, at one time regarded as of special diagnostic value, is now known to bear no relation whatever to pregnancy. The total quantity of urine is increased, and its specific gravity is lowered, averaging about 1014. There is a lessened urea excretion, an increased proportion of other nitrogenous substances, a decrease in the percentage of urea nitrogen, and a diminution in the total output of nitrogen.

Pressure exerted by the tumor of pregnancy upon the sacral plexus of nerves is common during the later months, and may be productive of intense neuralgic attacks or of the so-called "dead limbs." These manifestations may follow the pressure exerted by any pathologic growth.

Pigmentation of the face, forming the so-called **chloasmata**, **liver-blotches**, or **liver-patches**, is common in women of dark complexion. The discoloration is most marked upon the forehead and cheeks and around the eyes. If general over the face, it constitutes the *mask* of pregnancy. Such a condition may be present during menstruation and in association with uterine and ovarian disease.

**Nausea and vomiting**, the well-known "morning-sickness" of pregnancy, is a valuable reflex symptom, dependent upon irritation of the peripheral uterine nerves consequent upon progressive stretching of the uterine muscular fibers. It may immediately follow conception, although it usually does not appear until the sixth or seventh week. One-third of all pregnant women do not suffer from this symptom (Giles), and, again, it may be produced by many conditions other than pregnancy. If it occurs, it presents itself in 70 per cent. of the women in the first month, very rarely in the fifth and seventh months, and seldom in the second, third, or fourth month. Its duration varies from a few days to throughout the entire pregnancy, but it is rarely protracted beyond the fourth month. The nausea may be slight or severe, and generally appears immediately on rising—hence its popular name. It may occur, however, at any time during the twenty-four



hours, and especially after the ingestion of food. Other conditions that may produce nausea and vomiting are uterine displacements, uterine tumors, endometritis and metritis, chlorosis, gastro-intestinal disease, ovarian and tubal disease, and menstrual retention from atresia.

**Alterations of disposition** and other nervous phenomena may become prominent symptoms of gestation, and are strongly suggestive because of their unwonted presence. A fretful, irritable, or moody change will be noted, and this may be associated with the morbid craving for strange and disgusting articles or for certain kinds of food. There may be noted an unusual tendency to syncope and fainting fits. Neuralgic pains are of frequent occurrence, especially **Beccaria's sign**—an intense pulsating pain in the occipital region. Owing to the increased amount of circulating fluid with compensatory hypertrophy of the left ventricle, the woman's pulse generally becomes somewhat accelerated, reaching not infrequently 90 or 94 beats a minute, and this may be associated with an annoying sensation of throbbing and palpitation. The cardiac symptoms are dependent upon the hydremic condition of the blood. During pregnancy the entire glandular system of the body shows increased functional activity. This is especially noticeable in the salivary glands, which may throw out an abundant watery secretion (the *salivation* or *ptyalism of pregnancy*).

Finally must be noted an important series of **mammary** changes which are strongly suggestive of the existence of pregnancy, although not absolutely diagnostic. These changes are all peculiarly well marked in primiparæ, and include general enlargement and bagginess of the organs; enlargement of the glands of Montgomery; the deposit of pigment around the nipples; the development of colostrum; erectility of the nipples; tortuosity of the superficial veins; and pricking sensations around the nipples. The pigmentation assumes the form of areolæ surrounding the nipples, and are most prominent in brunettes. The colostrum is a very valuable sign, and consists of a serolactescent fluid appearing during the third month and persisting until the third day of the puerperium. The enlargement of Montgomery's glands results in the formation of tubercles clustering around the nipples and strongly suggesting advancing gestation. The presence of milk or milky fluid is not an absolute proof of gestation, since it has been noted in the breasts of males and in young and unimpregnated women. Lactation may also persist for months after gestation has ceased. Again, the absence of mammary changes does not contraindicate the existence of pregnancy.

## THE DIAGNOSIS OF PREGNANCY

The diagnosis of pregnancy will be made by reference to the signs just enumerated, many of which will be present in any given case. While considered separately some of these signs would not be absolutely diagnostic, when taken in combination with others a fairly presumptive diagnosis of gestation may be made. After the date of quickening the presence of the positive signs will make the diagnosis absolute. The

signs to be looked for will naturally vary with the period of pregnancy to which the woman has advanced.

For convenience in examination, pregnancy is universally divided into three three-months' periods or trimesters, each of which has its own peculiar manifestations. Thus, one would not look for the positive signs prior to distention of the abdominal walls—that is, in the first trimester. In the first half of the first trimester an absolute diagnosis is not possible. There are present, however, in the first trimester the two most important subjective signs of pregnancy, namely, menstrual suppression and nausea and vomiting. Associated with these will be found the vesical irritability, the increase in the anteroposterior diameter of the uterine body, the mammary changes, and the four soft signs, namely, the softened cervix, the soft and boggy uterine fundus, the softened lower uterine segment, and the softened and enlarged mammae. The coexistence of these signs will be strongly presumptive of an existing gestation.

In the second trimester of pregnancy—the fourth, fifth, and sixth months—there will be developed the positive signs of the condition. Thus, by the beginning of the fourth month Jacquemin's or Chadwick's sign (blue discoloration of the vulva and vagina) will be well marked, and Braxton Hick's intermittent uterine contractions may be detected; by the middle of the fourth month ballottement may be elicited, and quickening occurs shortly afterward; and by the beginning of the fifth month it is possible to detect the fetal heart sounds.

In the third trimester the fetal presentation may be ascertained by vaginal exploration, and abdominal palpation will disclose the fetal outlines.

**Differential Diagnosis of Pregnancy.**—This is a question which arises mainly in the early months of gestation. After the positive fetal signs have appeared there should be no difficulty whatever. In the early weeks of pregnancy, however, it may be difficult to decide whether a pregnancy or some pathologic tumor is present. If the uterine body can be distinguished, and it be not enlarged, the diagnosis would favor the presence of a pathologic growth. If the pelvic organs are concealed by masses of exudate, it may become necessary to trust to the developments of time to determine the matter. In advanced cases the diagnosis of the tumor of pregnancy from other abdominal distentions is generally a simple matter.

The **Abderhalden serodiagnosis test** for pregnancy, which was first suggested in 1912, while by no means a positive sign of gestation, may be used as a corroborative test. It is applicable from the sixth week after the last menstruation until the end of the third week postpartum. The reaction generally grows weaker toward the end of pregnancy and increases again during the puerperium. The diagnostic ferment is present in ectopic gestation as well as in normal pregnancy. The specific ferment appearing in the blood of pregnant women results from the entrance into the blood-current of decidual, chorionic, and syncytial cells from the placenta, and this ferment possesses the property

of digesting placental tissue. If, as a result of this digestive process, protein derivatives are present in the blood-serum, the mixture will turn a characteristic violet-blue color on the addition of 0.2 c.c. of a 1 per cent. aqueous solution of ninhydrin. If no color appears, it is to be assumed that the serum is from a non-pregnant woman.

Another interesting series of correlated subjects will now arise. One of the parties in a question at law may be a young girl, presumably too young for the question of gestation to arise; or, on the other hand, she may be an elderly woman well beyond the usual date of the menopause. Thus, it may be inquired, How early is gestation possible, or what is the latest period at which pregnancy has been noted? Again, is it possible for a woman to become pregnant without a consciousness of the fact at the time of conception? Can she be pregnant any length of time and yet be unaware of her condition? Again, is there any reason why the woman should endeavor to conceal an existing pregnancy; or is there, on the other hand, anything to be gained by her by feigning to be in the pregnant state?

It is a safe general rule to consider every female from eight to eighty years of age either as pregnant or as possible of conceiving, even when other apparently impossible circumstances, aside from the question of age, may be present. Thus, the existence of an unruptured or apparently imperforate hymen will not necessarily exclude the possibility of gestation; nor will the positive affirmation of lack of penetration preclude conception. Sherwood-Dunn records the case of a woman from whom he removed both ovaries; subsequently she married and gave birth to a male child.

**Precocious Pregnancy.**—By this term is meant the occurrence of gestation at an unusually tender age. Probably the earliest instance of pregnancy is that famous case recorded by Tidy: A girl who had menstruated first at four years of age, conceived and was delivered of a living child when but eight years old. An allied case is recorded of a seven-pound baby being delivered from a mother but eight years and ten months old. Wharton and Stillé report an instance of a baby menstruating in her first year, and being delivered in her ninth year of a child weighing  $7\frac{3}{4}$  pounds. Gleaves records the birth of a five-pound baby from a mother but ten years of age, and there are many instances recorded of girls of eleven to fourteen years giving birth to full-sized children. Wilkinson records the case of a negro girl who, when thirteen years, nine months, and five days old, gave birth to twins.

**Late Pregnancy.**—Cases equally as interesting as the foregoing have been filed of women conceiving late in life, and being delivered of normal children. Thus, Halles<sup>1</sup> records a labor occurring in a woman seventy years of age, and another in a woman of sixty-three years. Another physician records the birth of twins in a woman sixty-four years of age (Reese). It is not very uncommon to hear of women in the sixth decade giving birth to children. Hence, while the normal

<sup>1</sup> Manuel complet de médecine légale.



menopause occurs at from forty to forty-five years of age, this phenomenon may be indefinitely postponed, or ovulation may continue actively long after its associated phenomenon, menstruation, has ceased. Wolfe records an interesting case of a woman who menstruated for the first time when in her forty-third year, and continued to do so at irregular intervals until forty-five years of age, when she conceived and gave birth to a healthy child after a labor lasting but thirteen hours.

**Concealed Pregnancy.**—It is a much more common occurrence for a young girl to endeavor to conceal the fact that she is pregnant than it is for her to feign pregnancy for purposes of extortion or of forcing a marriage. The English law imposes no obligation to make pregnancy known. In Scotland, however, should the pregnancy be concealed and the child be dead or missing, the woman is liable to prosecution on the charge of infanticide. The concealment of birth is a much more serious misdemeanor (see *Concealed Birth*, p. 970).

**Feigned Pregnancy.**—It is rarely for purposes other than extortion or blackmail that a woman will pretend to be in gestation; hence, such a claim merits the closest investigation to prevent the perpetration of an injustice. Almost invariably such women feign an advanced pregnancy—that is, after the first trimester, and, fortunately, this is at a period when the true condition of affairs can generally be readily and positively recognized. It is easier, however, to prove the absence of a gestation than it is to prove that an existing distention of the abdomen is due to pregnancy. A refusal on the part of a woman to undergo a necessary examination will be safe grounds for declaring her imposition. Occasionally hysteric women may balloon the abdomen and produce curious movements of the abdominal muscles closely simulating the fetal motions. This constitutes a form of pseudocyesis that can be diagnosed by the administration of an anesthetic.

### IMPREGNATION DURING UNCONSCIOUSNESS—UNCONSCIOUS PREGNANCY

Here there are two closely allied and yet quite distinct propositions. The one indicates the occurrence of conception and early pregnancy in a woman, usually a married woman, without her entertaining any knowledge as to her true condition—*unconscious pregnancy*. The other is the occurrence in a woman, usually young and single, of gestation while the subject was in an unconscious condition, the result of deep sleep, coma, hysteria, hypnotism, or from the administration of an anesthetic. It must be recognized that intercourse during profound sleep (lethargy), either natural or the result of design, is quite possible. Such a condition will necessarily involve the question of rape. Under such circumstances it is not at all improbable for the woman to be unconscious of her delicate state during the first two or three months. After the fifth or sixth month, however, the continued menstrual suppression, together with the development of other diagnostic signs, should lead a woman with ordinary intellect to suspect her true condition. If she be a vir-

gin, the soreness in and injuries to the vagina and vulva invariably associated with the first coitus should lead her to suspect violation immediately on a restoration to consciousness. Only in idiotic or feeble-minded women is it possible to conceive of the unconscious carrying of a child to term, although several such cases are on record.

An assumed unconsciousness is, however, quite a possible complicating factor. A woman may thus ascribe her symptoms to some pathologic growth, her labor-pains to intestinal colic, and, even when confronted by the child, deny knowledge as to the time and circumstances of its conception. Again, in rare cases of artificial impregnation of a woman by means of a syringe, conception may follow without the knowledge of the woman. When there exist motives for so pleading, the case requires the closest examination. In married women who have remained sterile for many years, or who conceive at or subsequent to the menopausal period, it is quite possible to conceive of a gestation advancing to near term without an accurate knowledge on their part of the actual state of affairs. Such women are much more prone to ascribe their condition to some pathologic affection (ovarian cystomata, ascites, uterine fibroid) than to gestation. An examination by a qualified obstetrician will readily reveal the true condition.

**Pregnancy in the Dead.**—Occasionally, as for the purpose of identifying a woman or to prove her chastity, it will become necessary to make an autopsy to ascertain the condition of the genitalia. It must not be forgotten that in certain quarters there is a common practice of placing an unrelated fetus in the coffin of a woman in order to turn aside suspicion from the guilty person. The marks of gestation and delivery in the dead are to be found in the uterus, lower birth-canal, and in the ovary. An investigation of the uterine contents, even to a microscopic examination of the uterine scrapings for the presence of decidual cells and chorionic villi, may become of positive value in certain cases. Owing to the excessive hypertrophy of the uterine muscles in gestation, decomposition will speedily take place in that organ after death, and it may be converted into a putrescent mass long before the other tissues yield. Quite the contrary is true of the unimpregnated uterus, and should an examination of such a body be made some months after death, the soft structures will be found well advanced in decomposition, with the exception of the uterus, which will probably be firm and resistant. This will be accepted as a positive proof of chastity. Should the woman have given birth to a child just prior to her death and the examination be made within a few days or weeks, the usual lesions in the vagina and cervix will be found, together with perineal and vulvar lacerations and contusions.

The uterine contents that would indicate a pregnancy include an ovum, embryo, fetus, or fragments thereof; decidual and chorionic debris; bones, and moles. The earlier the examination is made, the more conclusive will be the proof; but if the embryo be advanced beyond the period of ossification, its bones may be recognized even though several years have elapsed since the maternal death. Microscopic ex-

amination of the uterine scrapings will reveal decidual cells and chorionic villi, both of which are diagnostic of pregnancy.

**Moles** also, if found, are proof positive of gestation. These include the *placental* or *fleshy* mole, and the *uterine hydatids*, or the *vesicular* or *hydatidiform* mole. The former is a thick, fleshy mass of tissue attached to the original placental site and consisting of both decidual and chorionic tissue, as shown by microscopic examination. It may include portions of an early ovum. Care must be taken not to confound such a growth with a uterine polypus, which generally consists of fibrous or muscular tissue suspended by a pedicle from some portion of the uterine wall, even as low as the cervical canal; it is not necessarily attached to the fundus, the common placental site. The vesicular mole is comparatively common, and consists of a mass of grape-like tissue filling the entire uterine canal and at places penetrating the wall of the uterus, even causing perforation. A fatty mole is merely a fragment of retained placental tissue that has undergone fatty change. Partially organized blood-clots may also be found in the uterine cavity. All the foregoing may be advanced as valuable evidence of pregnancy. Other instances, not conclusive proof of gestation, which may be found postmortem *in utero* are true hydatids, which are exceedingly rare (not more than four or five such cases having been recorded), and the membranous formation that is shed in the rare condition known as membranous dysmenorrhea. Should any of the true products of gestation be found in the uterine cavity of a woman whose pregnancy could not have advanced beyond the third month, the indications would point to a criminal abortion, as spontaneous abortion in the first trimester is accompanied usually by the discharge of an intact ovum.

An ovary of a dead woman may show a recent scar, or *corpus luteum*, following the discharge of an ovum from a Graafian follicle. Formerly it was believed that a difference existed in the corpus luteum following an unfruitful ovulation and that associated with pregnancy. The latter was believed to be much larger in size and deeper in color. Hence arose the terms *true* and *false* corpus luteum, the former being the corpus luteum of pregnancy. It is now recognized that no diagnostic significance can be attached to the scar of ovulation. Pregnancy can occur without an appreciable corpus luteum being found, though this is exceedingly rare, and a so-called *true* corpus luteum may accompany ovulation occurring during the growth of a uterine fibroid or any other condition, inflammatory or non-inflammatory, resulting in marked pelvic congestion, of which condition alone it is indicative, irrespective of the cause.



# LEGITIMACY—THE DETERMINATION OF SEX—SIGNS OF DELIVERY<sup>1</sup>

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## LEGITIMACY

**Legitimacy** is defined as "the state of being born in lawful marriage."<sup>2</sup> The question of legitimacy from the medicolegal point of view embraces the subjects of disputed chastity, the duration of pregnancy, viability of the child, the physical incapacity of husband or wife, child substitution, superfetation, and posthumous birth. In order to arrive at a definite conclusion in a given case medical and moral evidence, either alone or combined, may be employed. The question of illicit intercourse, with possible subsequent conception, while bearing indirectly upon the subject, is not to be included here.

It is presumed that any person born during the continuance of a lawful marriage between the mother and any man, or within a competent time after the dissolution of such marriage, is legitimate.<sup>3</sup> A child may, however, be shown to be illegitimate when it is possible to demonstrate that the man claimed to be the husband is practically incapable of being the father, as: (1) when he is under the age of puberty<sup>4</sup>; (2) when he exhibits some physical incapacity, as extreme age, or some natural infirmity, as azoöspERMISM; (3) when he was out of the country at the time the child was begotten, or a considerable length of time had elapsed since coitus had occurred, or from absence from home or death of the husband<sup>5</sup>; (4) where the impossibility is based on the laws of nature—that is, a white child is born of black parents, or vice versa.<sup>6</sup> The date of the birth is the time that receives special consideration, since it is a fixed time; the date of conception cannot accurately be determined, even when there has occurred but a single intercourse the date of which is known; conception in such a case may not follow for many days, during which time the spermatozooids retain their vitality in the female generative tract. Again, the child will be pronounced illegitimate if adultery on the part of the

<sup>1</sup> Grateful acknowledgment is due John C. Hinckley, Esq., of Philadelphia, and Lee Cohn, Esq., of Chicago, for information on all legal questions touched upon in this chapter.

<sup>2</sup> Rawle's Bouvier's Law Dictionary, 3d ed., vol. 2, p. 1927. Black, Comm., 446.

<sup>3</sup> Greenleaf-Lewis' edition, Philadelphia, 1896, sections 28 and 150; Chase's Stephen on Evidence, p. 255, second American edition, 1898. Modern American Law, vol. xiv, chap. 9, pp. 362, 363.

<sup>4</sup> King vs. Luffe, 8 East 207, 1807.

<sup>5</sup> American and English Encyclopedia of Law, 1st ed., p. 225.

<sup>6</sup> Whisterlos' case in Cross vs. Cross, Pagie Ch., New York, 139.

woman can be proved and the offspring is repudiated by the husband. The evidence of illegitimacy must be clear and decided in order to disturb the presumption of legitimacy.<sup>1</sup> Children born after marriage, no matter how soon, are presumed to be legitimate.<sup>2</sup> Even if the woman be pregnant by another man and be so far advanced at the time of her marriage as to have her condition recognizable by her husband, the law takes this as a recognition on his part of paternity, and, therefore, of legitimacy (Reese). Taylor recognizes the possibility of a child being conceived prior to marriage and born subsequent to the paternal or maternal death (postmortem cesarean section), and yet being legitimate. By the Common Law all children born out of lawful wedlock are bastards.<sup>3</sup> This is still the law of England. The Civil Law, however, provides that subsequent marriage of the parents renders the issue legitimate, and this rule has been enacted in many of the states of the United States—*e. g.*, Maine, Pennsylvania, Illinois, Michigan, Iowa, Minnesota, California, Oregon, Nevada, Washington, the Dakotas, Idaho, Montana, and New Mexico. In Massachusetts, Vermont, Illinois, Virginia, Indiana, Wisconsin, Nebraska, Maryland, Virginia, West Virginia, Kentucky, Missouri, Arkansas, Texas, Colorado, Idaho, Wyoming, Georgia, Alabama, Mississippi, and Arizona in addition to the marriage of the parents the father must have acknowledged or recognized the child as his. In New Hampshire, Connecticut, and Louisiana both parents must acknowledge, but in the last named state the acknowledgment is made either by an authentic act before marriage or by the contract of marriage, and an exception is made of those children born of an incestuous or adulterous connection.<sup>4</sup>

**Fecundity.**—The question of the physical incapacity of the father is one of considerable elasticity. How young may a boy be and yet be able to fecundate? It is stated that spermatozoa generally first appear in the semen at the fifteenth or sixteenth year, and fecundity dates from this time. They may, however, be found at an earlier date. Probably the youngest case of paternity on record is that furnished by Hirst, of a boy of thirteen who impregnated his sister of fourteen. It is generally believed that sexual ability in the male ceases after the age of sixty-five. Hirst, however, mentions two authentic instances of paternity at eighty-two and over one hundred years respectively. The absence of the male or female generative organs would imply inability to propagate; in the case of a female who was so incapacitated and was presenting a child as her legitimate offspring, the question of a supposititious child (*child substitution*) would arise.

The age of maternity is another variable factor. As we have already seen, cases of precocious pregnancy have been recorded at eight and nine years of age. In the Eastern countries maternity is not at all unusual at from ten to twelve years of age. It is rare for a woman to

<sup>1</sup> *Plowes vs. Bossey*, 31 L. J. Chan., 680, 1862.

<sup>2</sup> *Page vs. Dennison*, Greenleaf-Lewis' edition, Philadelphia, 1896, p. 168.

<sup>3</sup> *American and English Encyclopedia of Law*, 2d ed., p. 895.

<sup>4</sup> *Rawle's Bouvier's Law Dictionary*, p. 184. Bruce, 3d ed., p. 1928.

give birth to a child after the date of the menopause, and Barker states that women never conceive after fifty-five years of age.

**Supposititious Children.**—In the case of *supposititious children* it becomes the duty of the medicolegal examiner to inquire into the traces of heredity presented by the child, and the resemblance, physical or mental, to the alleged father. This will include examination as to features, voice, the gait; peculiar habits, traits, or tastes; the presence of characteristic nevi or birth-marks which have appeared in successive generations of the supposed father's family. An important point for close investigation is the age of the child and the questions as to whether or not its age will coincide with the alleged date of delivery. It is quite difficult at the proper time to secure a newborn child of the proper degree of development for the case in question.

An examination of the mother is also necessary in order to reveal the signs of delivery, which should be recent or remote, according to the alleged date of birth. The difficulty of adjusting the maternal condition to the age of the child is greatest in the more recent cases. Thus, a child of one month's postnatal development would not be accepted by a careful examiner as the child of a woman whose physical signs would indicate a delivery at a period not more remote than a week. It becomes imperative, if not from a purely obstetric point of view, at least from a medicolegal standpoint, that every woman claiming to have given birth to a child shortly prior to the arrival of her physician be subjected to a physical examination. This examination will be made ostensibly to ascertain if any of the secundines remain, or if any extensive traumatism has occurred from lack of proper supervision of the labor; in reality, it will also prevent the perpetration of the crime of child substitution should that be contemplated. If the woman or her family resist the making of such an examination, the physician would be justified in entertaining suspicions of some underhand proceeding, such as, in the wealthier classes, an attempt to secure title to an estate, and, in the lower classes, the extortion of blackmail. In case the refusal is persisted in, it becomes the duty of the physician to explain the serious medicolegal aspect that such a refusal entails, and if then the examination will not be permitted, his grounds for suspicion will be strengthened materially.

**The Duration of Pregnancy.**—In the determination of the legitimacy of a child it is very important that a knowledge be had of the normal average duration of pregnancy, the degree to which it may be prolonged (*partus serotinus*), and the degree to which it may be shortened and yet a living and viable child be born. The duration of a given pregnancy is a question incapable of accurate determination, as must be evident from the absolute uncertainty attendant upon the date of conception. If in every instance the time of the fruitful coition, or rather of the meeting of the ovum and the spermatozoid, could be ascertained, a basis could be had from which to calculate the probable date of confinement. As this accuracy is, as a rule, impossible in any given case, an approximate idea only can be obtained, and by taking



the average of a large number of such approximations, an estimate of the normal duration of pregnancy can be made. The meeting of the male and female elements may occur at any time from a few hours to three and a half weeks after coitus (Hirst). There are but two factors upon which an estimation can be based, namely, a single coitus the date of which is known, and the date of menstrual suppression.

From a study of the relationship existing between menstruation and ovulation, the two phenomena not necessarily coexisting, it is patent that an error of three weeks or more may be made in a calculation based upon menstrual suppression. The nearest that it is possible to estimate the duration of a pregnancy upon this basis is to compute 280 days—ten lunar or nine calendar months (forty weeks)—from the date of the last menstruation. This will give a date that is about the middle of a fortnight in which the labor will occur. Still, it must be borne in mind that pregnancy may begin during a period of pathologic menstrual suppression; and, again, that menstruation may continue for variable periods after conception, so that we have additional sources of error in this computation.

Merriman has collected 150 pregnancies in which the duration is counted from the date of the last menstruation. His table is as follows:

DURATION OF PREGNANCY DATED FROM THE LAST DAY OF THE CATAMENIA

Weeks.	Days.		Number of cases.	Percentage.
37th.....	from the	225th to the 259th day.....	5	3.33
38th.....	"	260th " 266th "	16	10.67
39th.....	"	267th " 273d "	21	14.00
40th.....	"	274th " 280th "	46	30.67
41st.....	"	281st " 287th "	28	18.67
42d.....	"	288th " 294th "	18	12.00
43d.....	"	295th " 301st "	11	7.33
44th.....	"	302d " 308th "	5	3.33
Total.....			150	100.00

The difference between the two extremes of this table is fifty-six days, and supposing every woman to have become pregnant five days before the menses, five, at least, passed the term of nine months by ten or twelve days.

It is probable that the history of a single coitus will give a more accurate means of estimating the duration of pregnancy, although here again there exists an element of doubt. It has clearly been demonstrated that spermatozoa may retain their functional activity within the generative tract for eight or ten days or longer, and during any portions of this time might fecundate an ovum. Hence, as the precise time of the meeting of spermatozoid and ovum cannot be determined, it is again impossible to ascertain definitely the duration of the pregnancy. Various obstetricians have computed the duration from a single coitus, and have obtained an average of 272 days. Thus, Faye found it to be 270 days; Ahlfeld, 271 days; Löwenhardt, 272 days; Stadfeldt, 272 days; Hecker, 273 days; Veit, 276 days; and Duncan, 275 days. According to Hirst, the duration of pregnancy is not 280 days, but nearer 252 days.

On the average, labor occurs 269 days after a fruitful coitus. The French authors usually give 270 days as the normal duration of gestation.

Reid has collected the history of 40 cases of pregnancy in women in whom impregnation was the result of a single intercourse, the date of which was accurately known. All the cases were instances of single women who dated from one coitus, or of married females whose husbands had been absent for a considerable time before the last intercourse. His table, which follows, demonstrates the varying duration of pregnancy, and, consequently, the variable date of parturition and delivery in women, even when the date of coitus is previously accurately established:

PREGNANCY IN WOMEN CALCULATED FROM A SINGLE COITUS

Weeks.	Days.		Number of cases.	Percentage.
38th.....	from the 260th	to the 266th day.....	5	12.50
39th.....	" 267th	" 273d ".....	7	17.50
40th.....	" 274th	" 280th ".....	18	45.00
41st.....	" 281st	" 287th ".....	6	15.00
42d.....	" 288th	" 294th ".....	4	10.00
Total.....			40	100.00

This table shows a variation of 34 days, while 18 cases, or 45 per cent., were delivered during the fortieth week, or from the two hundred and seventy-fourth to the two hundred and eightieth day.

Montgomery collected 56 cases of pregnancy in which the date of fruitful intercourse was known, as follows:

Weeks.	Days.		Number of cases.	Percentage.
35th.....	from the 239th	to the 245th day.....	1	1.79
36th.....	" 246th	" 252d ".....	0	0.00
37th.....	" 253d	" 259th ".....	2	3.58
38th.....	" 260th	" 266th ".....	2	3.58
39th.....	" 267th	" 273d ".....	10	17.84
40th.....	" 274th	" 280th ".....	22	39.28
41st.....	" 281st	" 287th ".....	9	16.70
42d.....	" 288th	" 294th ".....	8	14.28
43d.....	" 295th	" 301st ".....	2	3.58
Total.....			56	100.00

The variation in this table is 59 days. The shortest duration of gestation is 242 days; the longest, 301 days. The greatest number of children were born in the fortieth week.

Of the 246 cases in the preceding tables, 86, or 39.96 per cent., were delivered in the fortieth week; 43 cases, or 17.48 per cent., were delivered in the forty-first week; 38 cases, or 15.45 per cent., were delivered in the thirty-ninth week. One case was delivered on the two hundred and forty-second day (thirty-fifth week), and 5 in the forty-fourth week; the variation is 64 days.

The estimation of the duration of pregnancy from the date of *quickening* is also open to appreciable error. Thus, quickening, while gen-

erally occurring when pregnancy is half completed—that is to say, at about the middle of the fifth month—may occur as early as the twelfth week or not until the twenty-fifth week; in a few cases there may not be noted any fetal movements throughout the entire gestation. Again, intestinal peristalsis and irregular contraction of the abdominal muscles may simulate fetal movements so closely as to mislead not only the patient herself, but her attending physician also. Moreover, few women can tell the exact day, or even within 14 days, of the appearance of quickening. Hence this is an uncertain date from which to reckon.

There is, therefore, no absolute figure that may be stated as the positive duration of pregnancy in the human female. In some women eight calendar months is the full period to which they can carry their young, while others invariably go well beyond the average of 280 days. Thus, while the average may be as stated, normal gestation may last but 240 days, or be extended to 300 days or longer. This irregularity is but carrying out the law as observed in lower animals, in whom, even when the date of a coitus is well known, a marked variation in the duration has been noted. Reese has made a careful study of the duration of pregnancy in rabbits, cows, mares, and sheep, and noted the following points: The average duration of pregnancy in rabbits is 31 days, with a variation of 8 days. The average duration in cows is 285 days; yet in a certain proportion gestation will end as early as the thirty-eighth and in others not until the fifty-first week, giving a period of difference of 90 days, or three calendar months. In sheep the average duration of pregnancy is 151 days, with variations from 145 to 171 days, giving a period of difference of 26 days. In mares the average term of pregnancy is 300 days; it may not terminate until 360 days, or even, as Tessier has noted, not until 394 days. Willer, as quoted by Velpeau, proved, by hatching chickens in an oven, that the process takes from 18 to 25 days. A more detailed account of the experiments of Tessier, in France, and of Spencer, in England, as presented by J. Y. Simpson, is as follows:

#### PERIOD OF GESTATION IN COWS

Weeks.	Days.	Number of cows:		Percentage:		
		Tessier.	Spencer.	Tessier.	Spencer.	
37th....from the	253d to the	259th day....	6	12	1.05	1.60
38th....	" 260th	" 266th " ....	8	4	1.40	0.55
39th....	" 267th	" 273d " ....	51	24	8.91	2.80
40th....	" 274th	" 280th " ....	166	121	29.02	16.53
41st....	" 281st	" 287th " ....	202	392	35.31	52.27
42d....	" 288th	" 294th " ....	105	175	18.36	23.18
43d....	" 295th	" 301st " ....	27	16	4.72	2.12
44th and upward.	" 302d	" 321st " ....	7	7	1.22	0.93
Total.....			572	751		

Joulin<sup>1</sup> records the case of a cow that bore almost sixteen months, parturition being impossible; and another that bore her calf fifteen months and two days. Gronier observed a cow that bore twelve months,

<sup>1</sup> *Traité complet d'Accouchements.*



and Numan one that bore eleven and a half months. Joulin further remarks that it has been offered as an explanation of protracted gestations that they depend on the imperfect development of the fetus, which remains in the mother's womb until it has become fit for extra-uterine life.

#### PERIOD OF GESTATION IN MARES

' Of 200 mares,	3	foaled the 311th day.
"	1	" " 314th "
"	1	" " 325th "
"	1	" " 326th "
"	2	" " 330th "
"	47	" from the 340th to the 350th day.
"	25	" " 350th " 360th "
"	21	" " 360th " 377th "
"	1	" the 394th day.

The difference between the two extremes is 83 days.

**Protracted Gestation (Partus Serotinus).**—From the foregoing statement it must be admitted that it is possible for gestation in the human female to be carried well beyond the normal duration; a knowledge of this truth is exceedingly essential for the medicolegal expert. Indeed, as J. Y. Simpson,<sup>1</sup> as long ago as 1855, remarked: "The obstetricians who maintain that the period of human gestation is a fixed period and can never by any possibility exceed forty weeks (as was sworn to by five doctors in the Gardner Peerage Case, London; and by six doctors in the American Court, at Lancaster Quarter Sessions, Pennsylvania), have none of them adduced any reason why the period of pregnancy should thus be stable and invariable, while all other periodic processes in the human body, as dentition, puberty, menstruation, the date of quickening, etc., are universally known and acknowledged to be apt to vary extremely. These obstetricians have offered no reasons, so far as I know, for holding that similar variations could not take place in the duration of pregnancy. Indeed, it would be against all analogies from other actions and processes in the animal kingdom to suppose that such variations did not occur in regard to the function of gestation."

Extreme care should be taken in every instance to ascertain the truthfulness of the statements offered by the interested party, and to learn what reasons, if any, exist why a legitimate offspring is desirable. The earnest desire of a woman to save her reputation or to present an heir may influence her statements, and every reasonable element of doubt should receive careful consideration. In many countries the utmost limit to which a legitimate pregnancy may extend is decided by law. Thus, in Scotland, France, and Italy, if the pregnancy exceed 300 days, legitimacy is denied; in Germany a duration of 302 days is permitted, legitimacy in that country lying between 181 to 302 days after coitus. Unfortunately, no such legislation is recognized in the United States or in England, and the disputants are placed at the mercy of the medicolegal experts. Reese states that a pregnancy

<sup>1</sup> Obstetric Memoirs and Contributions, vol. i.

lasting 317 days has been allowed in America in a lawsuit on the charge of seduction.

Many interesting cases are recorded of exceptionally protracted gestation, and the current medical literature from time to time contributes additional authentic instances. In each case it would be well to take the physical appearance of the child, together with its weight, into consideration as important evidence of the overduration of pregnancy. This increase in the size and weight of the child is, however, not always to be noted. On the contrary, as Duncan<sup>1</sup> remarks, we find authors stating that in these so-called cases of protracted pregnancy the child is no larger than usual or is even smaller than ordinary. Montgomery<sup>2</sup> also states that "although in some of these cases of protracted gestation the child was of enormous size, it by no means follows that it should be so in all such instances; and in point of fact we find it expressly mentioned in some of them that the child was smaller than usual, as happened in one of Dr. Hamilton's cases; and Fodere says that in three instances in which gestation was evidently prolonged, the children were undersized and ill-thriven; while, on the other hand, the largest children are often produced where no extension of the term could have taken place." It is an incontestible fact that some children born three or four weeks before the estimated completion of pregnancy present the evidences of weight, of size, and of development of a mature infant, while a mature child *may be* small and undersized, though this is undoubtedly exceptional. Male children at term are more likely to be larger, stronger, and better developed than female children, although the average weight of all mature babies is  $7\frac{1}{2}$  pounds. Necessarily the duration of the pregnancy will be unlimited when the fetus lies outside of the uterine cavity. In these cases of extra-uterine gestation the child almost invariably dies at or shortly after term, but the product may be retained indefinitely, even for a space of forty years, as is recorded in an authentic instance.

Murray<sup>3</sup> records a case in which the interval between the cessation of menstruation and delivery was 330 days, but the child, which was still-born, weighed only  $7\frac{1}{2}$  pounds—a very average weight. In this instance it is probable that either the pregnancy was of normal duration, gestation having been ingrafted upon pathologic suppression of the menstruation, or the child had died at the normal end of pregnancy and had been retained until the time of delivery. R. Wilson<sup>4</sup> records a pregnancy in which 371 days elapsed between the date of the last menstruation and the date of the labor. Subtracting a possible error of 23 days for suppression from some other cause before pregnancy began, the duration would still be 348 days, or 11 months and 14 days— $2\frac{1}{2}$  months beyond the usual term. Even then, according to the history of the case, quickening must have occurred at the third month—an

<sup>1</sup> Fecundity, Fertility, and Sterility, Edinburgh, 1866.

<sup>2</sup> Signs and Symptoms of Pregnancy, London, 1856.

<sup>3</sup> British Medical Journal, 1889.

<sup>4</sup> University Medical Magazine, July, 1890.

unusually early period. Velpeau records the case of a quartipara delivered on the three hundred and tenth day; Hamilton, the case of an elderly primipara, aged thirty-seven years, who carried her child to the eleventh menstrual period. Wigodosky<sup>1</sup> reports the history of a tertipara whose pregnancy, based on the history of menstrual suppression, lasted eleven months. Dewees mentions four women who habitually carried their children ten calendar months. Desormeaux records the case of a woman who gave birth to a child after nine and a half months of gestation. Burns has met with a case in which gestation persisted for ten calendar months and ten days, dated from the last menstruation; and La Motte mentions the case of a woman delivered after a term of at least 297 days. Montgomery observed an authentic case in which the period of gestation covered 292 days. Resnikow<sup>2</sup> personally observed the case of a duipara who gave birth to a male child, considerably macerated and decomposed, eleven months after the beginning of her pregnancy. Acker<sup>3</sup> reports a case in which, dating from a single coitus, gestation persisted for 305 days, the child not exceeding in development an infant at term. Pürkhauer<sup>4</sup> records a case of partus serotinus on the three hundred and sixteenth day; Taussig,<sup>5</sup> a case of 323 days' duration; Hames,<sup>6</sup> a delivery 320 days after the date of menstrual suppression in a primipara, the child weighing 9 pounds, 10 ounces; Holland,<sup>7</sup> the case of a primipara in whom 340 days were noted between the birth of the child and the date of the last normal menstruation; in this case from the date of the last coitus to the birth was 323 days, and from the date of the menstruation following the last coitus (an abnormal period lasting only 2 days) the duration was 316 days. Armstrong<sup>8</sup> reports the case of a woman who, in her second pregnancy, advanced to the three hundred and third day, and in her fourth pregnancy to the three hundred and nineteenth day. Reid<sup>9</sup> records an authentic case in which pregnancy lasted 291 to 293 days; while Simpson reports four cases that carried their young a long time beyond the usual limit. The first bore her child 336 days from the last appearance of the menses; the second, 332 days, the patient having in the meantime passed through the perils of a shipwreck; the third, 319 days; and the fourth, 324 days, the child being born 198 days—6 months and 16 days—after the date of quickening. Tarnier<sup>10</sup> delivered a woman 40 days after term, the macerated fetus weighing 2½ pounds. The exact date of the child's death could not be determined. Leishman mentions a case in which labor occurred on the two hundred and ninety-fifth day; and Hedrick records the case

<sup>1</sup> *Medicinsk Obzrenie*, No. 2, 1896.

<sup>2</sup> *Centralblatt für Gynäkologie*, No. 24, 1894.

<sup>3</sup> *American Journal of Obstetrics*, 1889.

<sup>4</sup> *Friedreich's Blätter für gerichtliche Medicine*, 1890.

<sup>5</sup> *American Journal of Obstetrics*, October, 1901.

<sup>6</sup> *Lancet*, May 25, 1901.

<sup>7</sup> *British Medical Journal*, March 15, 1902.

<sup>8</sup> *Lancet*, 1890.

<sup>9</sup> *Ibid.*, 1890, ii, 79.

<sup>10</sup> *Journal des Sages-Femmes*, May 1, 1894.



of a primipara who was delivered on the three hundred and ninth day after intercourse. Woollett reports the case of a girl, sixteen years of age, in whom gestation lasted 316 days from the date of coitus; and R. McBride reports another case with an interval of 296 days between a single intercourse and the occurrence of labor. Issmer<sup>1</sup> finds that the duration of pregnancy increases with each child until the ninth, and then there is a decrease. The age of the mother is also an important factor, as every pregnancy up to the thirty-fifth year of the mother's life is four or five days longer than the previous one. The social condition plays a part, as it has been found by Pinard that of 1000 pregnancies among working women, 51 per cent. were concluded before 280 days had elapsed, whereas of 1000 women without active occupation, only 34 per cent. were delivered before 280 days. These figures show the influence of rest upon the lengthening of pregnancy. Women who have been vaginally examined are on an average confined 5.2 days sooner than those not examined. Issmer has also found that the average duration of pregnancy in 912 strong women was 278.6 days; in 288 weak ones, 276.8 days. It is probably true that in about 6 per cent. of pregnant women the duration of pregnancy is over 300 days, and von Winckel's statistics show that prolongation occurs in 11 per cent. from 302 to 322 days.<sup>2</sup>

**Abnormally Shortened Labor.**—While we have seen that pregnancy may be lengthened abnormally, it is just as true that it may terminate many days or weeks ahead of time. Indeed, this is a much more frequent occurrence than the former anomaly, and the two points of especial value to the medicolegal expert are the determination of the degree of development of the fetus at any given period, and the determination of the period of viability of a child, or its capacity to live after birth—that is, as an independent being.

It is not at all infrequent for a woman periodically to terminate her pregnancy at the eighth month. For her, eight months' growth constitutes the development to term. Hence, should the question arise, Was this child conceived prior to marriage, no coitus having been indulged in by the couple before the consummation of the vows? an examination of the physical characteristics of the infant will probably decide as to its period of development. Especially will this be simplified if the child be still-born, so that an examination of its organs and bony structures will be possible. A most instructive point to note in this connection is the length of the fetus, which is a factor bearing a more permanent relation to the development of the child than do the size and weight. There is no relationship existing, however, between the size and degree of stoutness of the mother and the size of the offspring, a large and well-developed woman often producing a small and immature baby with considerable difficulty, and vice versa.

Recognizing the importance of the length of the fetus in determin-

<sup>1</sup> American Journal of Obstetrics, October, 1901.

<sup>2</sup> See London letter, Jour. Amer. Med. Assoc., 1921, 77, 716, in which the court admitted the possibility of a period of gestation of 331 days.

ing the degree of development in a given case, Ahlfeld has formulated a rule and table whereby fetal size may be determined pretty accurately even before birth. He finds that the long axis of the fetus lying flexed in the uterus (the fetal ellipse) is nearly half the entire length of the fetus when extended. The long axis of the fetal ellipse may be determined approximately by placing one arm of a pelvimeter in the vagina against the fetal presentation, while the remaining arm rests on the extremity of the fetal ellipse in the uterine fundus. On doubling this measurement the approximate length of the fetus at the given period of pregnancy will be obtained. In the following table are given the measurements and weights of the fetus at varying periods in the latter half of pregnancy, as determined by this method:

Time.	Axes of fetal ellipse.	Length of fetus.	Weight.
At the 25 h week. . . . .	17½ cm. (6.88 in.)	35 cm. (13.77 in.)	1213 gm. (39 oz.)
" 28th " . . . . .	20 " (7.87 " )	40 " (15.75 " )	3½ pounds.
" 30th " . . . . .	20½ " (8.12 " )	41¼ " (16.25 " )	4¼ " "
" 33d " . . . . .	21 " (8.36 " )	42 " (16.73 " )	4½ " "
" 34th " . . . . .	21 " (8.61 " )	43¾ " (17.22 " )	5½ " "
" 35th " . . . . .	22 " (8.75 " )	44½ " (17.51 " )	6 " "
" 36th " . . . . .	23 " (9.40 " )	47¾ " (18.80 " )	6½ " "
" 38th " . . . . .	24½ " (9.65 " )	49 " (19.29 " )	6½ " "
" 40th " . . . . .	25½ " (9.84 " )	50 " (19.68 " )	6¾-7½ " "

There is, of course, just as much variation in newborn infants as regards size and development as in children of older growth. A fetus carried to term may be smaller and punier than a fetus of eight months' growth; and one fetus of eight months' development may be larger than another of the same age. As a rule, however, there will be present characteristic marks that will determine pretty accurately the age of development. The use of the *x*-rays during advanced pregnancy to determine the degree of *fetal* development and the presence of points of ossification may be of value in this connection.

**Paternity.**—The question of paternity may arise not only in these cases of birth of a child at some time before the normal duration of pregnancy, but also in cases of posthumous birth occurring over nine calendar months subsequent to the paternal death; in cases of supposititious children advanced as legitimate heirs to an estate; and in cases of bastardy with an attempt at blackmail. This intricate question can be solved only by the presence or absence of paternal characteristics of face, form, speech, traits, and manner; or by the presence or absence of paternal physical peculiarities or defects, although the latter may be present in a given case without any possibility of paternity—namely, as a result of the occult process known as *maternal impression*, in which a peculiarity, mental, physical, or both, is stamped upon an offspring as a result of some profound mental impression made upon the mother while carrying the child. This impression may be made merely on sight by a man other than the legitimate husband, and the defect in the child does not necessarily imply illicit relations. The equally occult question of *telegony*, or the influence of a previous sire upon the children of a subsequent one through the same woman, must also be borne

in mind. Such a transmission of previous paternal traits is well recognized in horses and cattle, and isolated instances have been noted of a similar character in man.

**Viability.**—By the viability of a child is meant the ability manifested by the child to survive as an independent being apart from its mother. The age of viability varies in diverse species of animal-kind. It is conceded generally that 180 days, or six calendar months, is the age of viability for the human infant. Undoubted cases have been reported where the fetus was born just at six months of intra-uterine development. Infants born in the fifth month or even as early as the fourth month, have survived for a short time, but such infants can never be conceived as having reached the period of viability. In instances in which infants of supposedly less than six months' duration have survived, doubts must be entertained as to the accuracy of the calculation. The only reliable evidence in such cases consists in a careful expert investigation of the tissues and organs of the child if it subsequently die, or of the physical manifestations at the time of birth. Children born at this tender age (six months), if they survive the perils of infancy, are very prone to succumb in early childhood or in early adult life to diseases that children of ordinary vitality would survive.

**Live Birth.**—An interesting medicolegal question naturally arises in this connection—namely, what constitutes a live birth? Upon the answer to this query will often depend the decision in important trials for the rights of inheritance and similar legal questions. It is now generally recognized that, for a live birth to be accomplished, it is necessary that the whole body be brought into the world. There must be independent circulation; the whole body of the child must have come forth from the body of the mother, but the umbilical cord need not have been separated. Reese states that “according to the laws of the United States and England neither breathing nor crying are essential to establish a live birth; the pulsation of the child's heart, or of one of its arteries, or the slightest voluntary movement, is regarded as sufficient for this purpose. In Scotland, crying is regarded as essential; in France, respiration; and in Germany, crying, attested by unimpeachable witnesses.” Live birth, therefore, is to be looked upon as quite a different thing from viability. A live birth at four or four and a half months will win a law-suit, it may be, of one kind—as, for instance, a question of *tenancy by courtesy*, where a husband acquires a life interest in the property of his wife at her death, provided a living child is born during the life of the mother—that is, not postmortem cesarean section—and not manifesting the traits of a monster; but it would not win a suit requiring the delivery of a viable infant in the full sense of the term as already given. It is now very well settled that a child *en ventre sa mere*, for all practical purposes tending to its own benefit, is considered as absolutely born.<sup>1</sup>

**The Appearance of the Fetus at the Different Months of Gestation.**—From the foregoing statements it becomes evident that

<sup>1</sup> American and English Encyclopedia of Law, 2d ed., p. 719, vol. 5, p. 1083, note.



an exact knowledge of the characteristic features of the embryo and fetus in successive months of gestation is most important in medico-legal practice. In the following classification these features are fully presented:

**Fetal Development at the Successive Months of Gestation.—**

**From the Fourth to the Twelfth Day (the Time of Entrance into the Uterine Cavity).—**The embryo exists at first merely as the disk-like embryonic spot. Soon a tube appears, the primitive neural canals opening below and supporting below a globular bag. The dorsal or abdominal plates are visible. The embryo lies within the *zona pellucida*. Size of the ovum,  $\frac{2}{3}$  cm. ( $\frac{1}{4}$  in.); of the embryo,  $\frac{1}{4}$  cm. ( $\frac{1}{10}$  in.).

**From the Fourteenth to the Eighteenth Day.—**The embryo appears as a semitransparent, gelatinous, flocculent mass, measuring about  $2\frac{1}{2}$  lines in length, or  $\frac{1}{8}$  inch.

**First Month.—**The amnion and umbilical vesicle are fully formed; the allantois is present, but is not united with the chorion; there is but a small amount of liquor amnii; the visceral arches are distinct; the spinal canal is closed. The curved form of the fetus is noticeable. The fetal heart may be distinguished; there are primitive traces of the liver and kidneys; the nasal pits and eyes appear, as do also the intestine and the anal and oral orifices; the extremities are rudimentary. The length of the ovum is about  $\frac{3}{4}$  inch; of the fetus, 1 cm. ( $\frac{1}{8}$  inch or 4 to 6 lines); its weight is 20 gr.

**Second Month.—**The embryo is the size of a pigeon's egg. The amnion is distended with fluid, and is in contact with the chorion. The chorionic villi are well developed at the placental site. The umbilical vesicle is small; the umbilical cord is distinct, and the umbilical vessels visible. The visceral clefts, with the exception of the first, are closed; the head forms more than two-thirds of the embryo; the eyes, nose, mouth, and ears are distinguishable; there are primitive traces of the hands and feet, which are webbed; the vertebræ are present; the form and disposition of the brain and cord can be recognized. There is beginning formation of the external genitals, although sex is not differentiated; the sylvian fossa is present; there is a beginning of the ossification of the lower jaw, ribs, vertebral bodies, and clavicle; the circulatory system is forming; the wolffian bodies are present, although beginning to disappear; the kidneys and suprarenal capsules are forming. The length of the fetus is 4 cm. ( $1\frac{1}{2}$  inches or 15 to 18 lines); its weight is 4 gm. (60 to 62 gr.).

**Third Month.—**The embryo has attained the size of a goose-egg; nourishment takes place by means of maternal blood; the chorionic villi are lost; the placenta is formed, but is small; the umbilical cord is spiral, and about 3 inches long; the decidua reflexa and decidua vera come in contact; the pupillary membrane is present; the eyes and mouth are closed; the teeth begin to appear; the digits become distinct (they are not webbed, and show membranous nails; the toes are still webbed); the neck is distinguishable; the ribs are formed; the genital organs are very prominent, the penis and clitoris being of equal length;

the uterus appears, thus distinguishing the sex; the integument is forming; the tubercula quadrigemina, optic thalami, and corpora striata may be seen; points of ossification are present in most of the bones. The length of the fetus is 9 cm. ( $3\frac{1}{2}$  inches); its weight is 30 gm. (450 gr.).

**Fourth Month.**—The placenta weighs about 3 ounces. There is a formation of Wharton's jelly in the cord; the latter is two or three times the length of the fetal body; the head is about one-fourth of the body length; there is a formation of short silvery hair upon the scalp, and of lanugo upon the body; the skin is rosy and very delicate; the mouth is open; the external ear measures  $5\frac{1}{2}$  to  $7\frac{1}{2}$  mm.; there are a development of the convolutions of the brain and a formation of the muscles; the pupillary membrane is quite distinct; the intestines contain meconium; the sex is well defined; ossification begins in the lower segments of the sacrum, and in the frontal and occipital bones; the liquor amnii is relatively less in quantity, and the fetus nearly fills the uterine cavity. The umbilical cord is about 7 inches in length, and is inserted above the lower fourth of the linea alba. The length of the fetus is 16 cm. ( $6\frac{1}{3}$  inches); its weight is 55 gm. ( $848\frac{3}{4}$  gr.).

**Fifth Month.**—The placenta weighs 6 ounces; the umbilical cord measures 12 inches; the hair and nails are fully formed; the head, heart, kidneys, and liver are disproportionately large; the vernix caseosa appears; the face is wrinkled and senile. The external ear measures from 8 to 12 mm. in length; the pupillary membrane is still present. The eyelids begin to open; the sylvian fossa becomes triangular; the fissure of Rolando appears; the brain weighs 720 gr. (Wenzels), ossification begins in the pubis, calcis, and ischium. The length of the fetus is 25 cm. ( $9\frac{3}{4}$  inches); its weight is 273 gm. (10.8 ounces). Fetal movements are perceptible.

**Sixth Month.**—There is a beginning deposition of fat in the subcutaneous cellular tissue; the color of the body is cinnabar red (Reese); the palms and soles are purplish in tint; there is increased growth of hair, and the appearance of eyebrows and eyelashes; the head is very soft, and the fontanelles wide open; the membrana pupillaris is present; the eyelids are adherent; the umbilicus is slightly above the pubis; the testicles commence to descend toward the inguinal rings; the labia project but do not cover the clitoris; there is beginning ossification of the manubrium and pubic bones; a small quantity of meconium is found in the colon; the bladder is small, hard, and pyriform. The external ear measures from 16 to 24 mm.; the sylvian fissure is formed, and the precentral, inferior frontal, and intraparietal cerebral sulci appear. The length of the fetus is 30 cm. (10 to 11 inches); its weight is 715 gm. (23 ounces).

**Seventh Month.**—The skin is still wrinkled and reddish, and is covered with vernix caseosa; the lanugo begins to disappear from the face; the hair on the scalp is about  $\frac{1}{2}$  inch long; the eyelids are open; the membrana pupillaris disappears; the medulla oblongata can be distinguished; the cerebral convolutions begin to form; the ears lie close

to the side of the head; the external auricle measures 26 mm.; the testicles are at or in the inguinal canal; the decidua reflexa and decidua vera have now thoroughly merged into one; the finger-nails do not quite reach the fingers' ends; meconium exists in the large intestine; ossification centers appear in the astragalus and first piece of the sternum. The length of the fetus is 35 cm. ( $13\frac{3}{4}$  inches); its weight is 1213 gm. (39 ounces).

**Eighth Month.**—The lanugo begins to disappear from the face; the skin is thicker and of a more natural color; the nails are harder, but do not project beyond the finger-tips; valvulæ conniventes are found in the small intestine; the breasts often project; the liver is still very large; the left testicle is in the scrotum; the lungs are reddish; the insertion of the funis is but slightly below the middle of the body; the external auricle measures from 26 to 28 mm.; ossification begins in the second piece of the sternum and in the lower epiphysis of the femur; the brain weighs 4860 gr. (Wenzels). The length of the fetus is 40 cm. ( $15\frac{3}{4}$  inches); its weight is 1617 gm. ( $4\frac{1}{2}$  pounds).

**Ninth Month.**—There is a great increase in the amount of subcutaneous fat; the face loses its wrinkled and senile appearance; the lanugo begins to disappear from the body; both testicles are in the scrotum; the vulva is closed; the gray portion of the brain begins to appear; the weight of the brain is 6150 gr. (Wenzels); all the diameters of the fetal head are about 1 cm. ( $\frac{1}{3}$  inch) smaller than at term. The length of the fetus is 45 cm. ( $17\frac{3}{4}$  inches); its weight is 1990 gm. ( $5\frac{1}{2}$  pounds).

**The Fetus at Term.**—The body of the fetus at full maturity is well rounded; the lanugo has disappeared; the face has lost its wrinkles; the skin is rosy; the nails project beyond the finger-tips; the eyelashes and eyelids are well formed; the eyes are open; the bones of the cranium are in contact; the fontanelles are small; the cerebral convolutions are numerous; the cuboid bone is beginning to ossify. The osseous deposit in the inferior epiphysis of the femur measures 2 or 3 lines in diameter; meconium is present in the large intestine only, which it nearly fills; the breasts are well formed and contain secretion; the bladder contains urine; the length of the foot is 8 cm. (3.14 inches); this is regarded by many as an important proof of fetal maturity. The external auricle measures 33 to 36 mm.; the ear and nose cartilages feel hard; the cord is inserted from 8 to 10 lines below the center of the body (Moreau). The length of the fetus is 50 cm. ( $19\frac{2}{3}$  inches); its average weight is 2737 gm. ( $7\frac{1}{3}$  pounds). Children at full term may weigh only from 4 to 6 pounds, or they may, without prolongation of pregnancy, have a weight of from 12 to 14 pounds. Such a weight, however, presupposes an overextension of pregnancy. The weight is not so constant as the length of the child.

**Multiple Pregnancy.**—Closely allied to the question of legitimacy is the subject of multiple pregnancy, which may manifest itself in various and perplexing ways. This will include a consideration of twin pregnancy, in which one child is delivered, but the other is not



born for several weeks or months subsequently; superfetation; a double uterus; and a co-existing intra-uterine and extra-uterine fetation.

**Superfetation.**—By this term is meant the fertilization of an ovum when there is another ovum from a previous ovulation in uterogestation. These children may be delivered at the same birth, the one showing signs of maturity and the other of immaturity; or else both are born at full term at an interval of from one to three months, according to the difference in the dates of conception. For a long time the possibility of such an occurrence as this was absolutely denied. A few authentic cases, however, have shown that it may exceptionally occur, but only within the first three months of gestation, before the union of the decidua reflexa and decidua vera has been completed. During this time a new ovum can be fecundated, no insurmountable barrier existing to the ascent of the spermatozoid. A more difficult point to decide is the question as to the continuance of ovulation during gestation. While it is undoubtedly true that, as a rule, this process is abolished during the progress of a uterogestation, exceptions to the rule occur here just as readily as they do in all the other functions of the body. This has been proved by the delivery of twins one black and the other white, the product of different coitions with different paternity; and by the presence of combined intra-uterine and extra-uterine gestation advanced to different periods, the extra-uterine product showing the more advanced development, although subjected to greater difficulty in the securing of proper nourishment than its fellow *in utero*, hence being of prior formation. The mere suppression of the menstrual function during the progress of pregnancy does not necessarily indicate the abolishment of ovulation at the same time. As we have seen, the two are not interdependent.

The theory advanced by obstetricians who do not believe in the possibility of superfetation as an explanation of cases of this description is that of the existence of a twin-gestation in which one embryo, imbibing more nutriment than the other, outgrows its fellow; thus one may appear of but seven or eight months' development and the other show full maturity; or they advance the possible existence of a double uterus (*uterus bipartitus*) in which one ovum is fertilized in either uterus at successive coitions. The unmistakable evidences, however, of double conception in lower animals prove the possibility of the same in women. Thus, Reese reports the instance of a mare covered successively by a horse and an ass, and producing at the same birth a horse and a mule. It is beyond doubt, however, that twin intra-uterine pregnancy may be associated with anomalies of development such as have been mentioned. Monstrosities may result from too intimate union of the twin embryonal parts; or through some vagary of nature one embryo may be better nourished and outgrow its fellow, which may perish at an early age and undergo mummification or calcification during the growth of its fellow. Such an embryo (*fetus papyraceus*) may be expelled at any subsequent period of the gestation, at the time of the birth of the living child, or at some subsequent period. It is also quite possible to conceive of a twin,

undersized through improper nourishment, being retained in utero for two or three months longer than its fellow, until it has arrived at a proper degree of development. This would substantiate the view of those who believe that only a mature fetus is fitted by nature for birth. The further apart the births of the children, the greater the improbability of the existence of superfetation. It is known that a woman can conceive within a fortnight after delivery (Bonnar), so that it would be possible for her to be delivered of a mature fetus on a given date, and about nine months subsequently bear another mature fetus. This, however, does not constitute superfetation.

## THE DETERMINATION OF SEX

### HERMAPHRODITISM

In certain questions touching upon "live birth" and "tenancy by courtesy" an analogous subject may arise should the fetus, which may have survived or have lived for only a few minutes after separation from its mother, present abnormalities of its genital organs, or should they be so immature as to render doubtful the sex of the child. Should the offspring be monstrous, it is not considered as capable of inheriting; and should a male child be desirous, it will become most imperative in these cases of so-called hermaphroditism to determine accurately the sex.

In the true sense of the term, hermaphroditism means the presence in one individual of the generative organs of both sexes; it is by license now applied to all individuals in whom the sexual organs are so obscure or distorted as to render doubtful the individual's sex. A true hermaphrodite is exceedingly rare, but, according to Gould and Pyle, some cases have been proved such by dissection, portions or even entire genitalia of both sexes having been found in the same body.

Two distinct types of pseudohermaphroditism occur—the male and the female. In the one there will be a cleft scrotum, an ill-developed penis, perhaps hypospadias or epispadias, rotundity of the mammæ, and feminine contour; in the other a prolonged clitoris, prolapsed ovaries, grossness of figure, and hirsute appearance. As will be noted in these individuals, the anomaly in most cases consists of a malformation of the external genitals. There exists a type of hermaphroditism in which it is impossible definitely to declare the sex, even after careful dissection of the parts; these individuals have been termed *neuter hermaphrodites*.

In determining sex the presence of ovaries or testicles is the important point to ascertain. Periodic discharges of blood would indicate a female, while an escape of semen would designate the male. The absence of one testicle (**monorchid**), either congenitally or postoperative, is no bar to procreation, nor does failure of the testicles to descend (**cryptorchid**) interfere absolutely with the procreative power of the individual. In the unfortunate subjects of pseudohermaphroditism it

is often impossible to come to any positive conclusion as to their sexual nature until the time of puberty. It may be then that the distinctly feminine or masculine traits will develop and assign the individual to his or her place in life. Often, however, a truly feminine individual will at this time or subsequently assume masculine features, such as the development of a beard or the deepening of the voice. The reverse may be true of male pseudohermaphrodites.

As might be expected, the legal aspect of hermaphroditism is a complicated matter. In Rome, according to the authorities already quoted, "a hermaphrodite could be a witness to a testament—the exclusive privilege of a man—and the sex was settled by the predominance of distinctive traits. If the male aspect and traits, together with the generative organs of man, were more pronounced, then the individual could call himself a man. There is a peculiar case on record in which the question of legal male inheritance was not settled until the individual had lived as a female for fifty-one years." In later life the question of sexual development or capacity plays an important rôle in deciding suits for rape, impregnation, and allied subjects.

### THE SIGNS OF DELIVERY

In the determination of a lawsuit on the plea of legitimacy it will frequently become necessary to make a physical examination of the woman to discover the presence or absence of the signs of a delivery, either remote or recent, according to the age of the child. This investigation is much more frequently necessary than is a medicolegal investigation to ascertain the existence of pregnancy, and naturally is required in cases of concealment of birth or infanticide. The questions arising are, Is there any reason for suspecting a pregnancy and delivery, either from the physical condition of the woman herself or from the actions of her friends? and, in the case of a feigned birth with the presentation of a supposititious child, Has this woman upon her body the marks of a delivery that will correspond in date to the age of the child? In case the question is one of criminal abortion in which the woman has perished, or it becomes necessary to prove the chastity of a woman recently deceased, an examination of the body is essential to reveal the signs of parturition, premature or at term, that must exist. Naturally, then, the subject divides itself into the two great headings—the signs of delivery in the living and in the dead.

**Signs of Delivery in the Living.**—The expulsion of the product of conception at any time during pregnancy before the full completion of the nine months of intra-uterine life is called by the law *miscarriage* or *abortion*. No arbitrary division, such as exists in the obstetric sense of the words, is recognized between the terms miscarriage and premature labor. Obstetrically, an abortion is the discharge of the ovum at any time during the first three months of pregnancy; miscarriage is the discharge of the fetus during the second trimester of pregnancy (fourth, fifth, and sixth months); and premature labor is the dis-



charge of the fetus between the sixth and ninth months. This distinction does not hold in a legal sense.

The **signs** that will be present depend upon the stage to which the pregnancy has advanced and the date at which the examination is made. An early abortion, between the second and third months, may leave no signs whatever, the ovum usually escaping in its entirety without lacerating the cervical tissues, which quickly contract. Probably all that the expert would have to depend upon in such a case would be a microscopic examination of the scrapings of the uterine cavity and the existence of a slight uterine enlargement. If the microscope reveals the characteristic decidual cells, which exist only in the presence of a gestation, a positive proof would be had of the woman having recently passed through an early delivery. This examination will prove fruitless if not made within the first two or three days; by that time the parts will have returned to their normal condition.

After abortion in the third or the fourth month there would persist for a few days a patulous and congested condition of the vulvar tissues, with the presence of more or less vulvar and vaginal contusions or abrasions; the cervix uteri will also present a characteristic funnel shape (Spiegelberg), and the breasts would be congested and heavy, probably showing the presence of a small amount of serous fluid (colostrum). If a septic infection has occurred at the time of delivery, the signs would persist for a longer time, and would be associated with exudate into the uterine and peri-uterine tissues. During menstruation there will be present a certain amount of vaginal relaxation, together with a bloody discharge which must not be confounded with that of early abortion. The characteristic odor of the decidual tissue will be of value in making a diagnosis in these cases. Herold emphasizes the general anemic appearance in early pregnancy, associated with dryness of the skin and a peculiar excitement of the pulse. Very often in early abortion there will be no constitutional symptoms upon which to base a diagnosis; this is due to the slight amount of traumatism attendant upon discharge of the small ovum.

After **delivery at term** the signs that will be present are necessarily more pronounced and longer in their duration. They will be noted in an examination of the breasts, the abdominal surface, and the genital organs. Even in these cases, however, it is important that the examination be made as early as possible after labor, for the woman's tissues promptly regain their normal condition. In most cases, after the lapse of from eight to ten days, it is difficult, if not impossible, to make a positive statement that labor has occurred. For instance, in a case of alleged child murder, two weeks after the labor the parts will have so far regained their usual condition as to present only the slight lesions that follow an abortion; the woman could readily, in such a case, deny a recent delivery at term, and claim that her pregnancy resulted in an early abortion, thereby avoiding the penalty of infanticide. Again, a complicating factor would be the existence of a twin pregnancy or of a superfetation, in which the blighted ovum was discharged, giving the

physical signs of an abortion or labor, the normal pregnancy, however, continuing to term.

The breasts after a delivery at term will show some very characteristic changes. They will be enlarged, boggy, turgid, or hard and nodulated; and, for a varying period subsequent to labor, will invariably contain serous fluid or true milk. The nipples will protrude, the superficial veins will be prominent, and the areolæ will be more or less pronounced. If the secretion of the breasts be arrested, there may be noted on the more or less relaxed and pendant organs the striæ of lineæ albicantes resulting from the subcutaneous stretching. The colostrum under the microscope will show the characteristic colostrum corpuscles—large, round, and faintly granular, and showing nuclei under the action of acetic acid.

The abdominal walls will be relaxed, wrinkled, pendulous, and scarred with lineæ albicantes and striæ. The viscera may be readily palpated, and if the examination be made within a week of the labor, the uterus will be felt as a large hard body, reaching well above the symphysis pubis. This same condition of the walls may result, however, from ascites or a large ovarian or uterine tumor, or in emaciation occurring subsequent to obesity. It is of value, therefore, only if associated with changes in the breasts and genitalia. The general surface of the body and the face will be pale; the skin moist and clammy; the pulse soft and compressible; and the general condition one of relaxation and weakness.

The genital organs are relaxed, more or less swollen, and bathed in the lochial discharges. The vagina is smooth, relaxed, and capacious, and may show recent tears or cicatrices. The perineum may be torn, granulating, or fully cicatrized, and lacerations or evidence of laceration here are very reliable signs of delivery. The cervix is enlarged and not so compact in structure as normally. Within twenty-four hours the internal os begins to close if all the uterine contents are extruded; the external os remains patulous for several days, and may show a transverse laceration. The uterus is enlarged, as shown by the passage of the sound and by palpation, its size varying according to the time that has elapsed since the birth of the child. The lochial discharge—which may be absent after the third day, but usually continues for from a week to two weeks or longer—may be recognized by its peculiar odor and characteristic changes, and microscopically by the decidual débris. For the first three or four days it is almost pure blood, is red in color, and is known as the *lochia rubra*; it then becomes serous in nature (*lochia serosa*), and so remains for another three or four days; finally, it is almost pure pus of a yellowish or greenish color (*lochia alba*). The labia are thickened and voluminous, and may show abrasions and contusions; the commissures are less clearly defined, and the posterior usually is ruptured; the *carunculae myrtiformes* are present, and are most prominent in primiparæ.

**Signs of Delivery at a Remote Period.**—All the foregoing signs, with the exception of uterine enlargement and the presence of tears and

scars, will have disappeared at the expiration of from ten days to a fortnight; hence the importance of an early investigation in cases demanding a medicolegal examination. In the cases that come under observation after this period it is important, in the first place, to ascertain how long a time has elapsed since the birth of the child. After eight or ten days it is a difficult matter to state definitely that a woman has been delivered at term; after two or three months it is legally regarded as impossible to assign the date with any degree of precision, and especially is this true if the woman be a primipara. In multiparous women there are present certain signs that indicate the previous occurrence of labor. These consist in a more or less flaccid condition of the abdominal walls, with the presence of glistening white scars upon the flanks (*lineæ albicantes*) in the vast majority of cases. Mann states that in 8 per cent. of child-bearing women these scars are absent, and it must not be forgotten that they may result from causes of abdominal distention other than pregnancy, as uterine and ovarian tumors, ascites, and after such wasting fevers as typhoid and typhus. The breasts will not be firm and protuberant, as in virgins, but softer and pendulous; the nipples also will be larger and more prominent, and there will be greater discoloration of the areolæ. The vulva will be patulous, the labia relaxed, the hymen absent, the myrtiform caruncles prominent, the commissures indistinct, the fourchet absent or presenting a line of scar formation, and in at least 35 per cent. of the cases a laceration of the perineum, more or less extensive, will be noted. The rugæ of the vagina are obliterated, the vaginal walls are relaxed, and if a laceration of the floor exists, there may be associated a partial displacement of the anterior wall (cystocele). The cervix uteri will be larger than in the virgin, and may show scar tissue; the os is linear, and may admit the tip of the finger. In a certain proportion of multiparous women, especially if the children have not been carried to term, these signs will be absent, and it will be impossible to distinguish the women from nulliparæ.

**Signs of Delivery in the Dead.**—After death from supposed criminal abortion, or in certain cases of claim upon an estate by an infant whose mother died during or shortly after delivery, it may become necessary to institute a postmortem examination of the woman to discover, if possible, the signs of parturition, recent or remote. In each case the history during life will materially assist in arriving at a safe conclusion. Interesting instances of attempted concealment of birth have been recorded in which advantage has been taken of the occasional phenomenon known as *coffin birth*. By this term is meant the postmortem expulsion of a child between the thighs of its mother as the result of the action of the gases of decomposition. Certain women desirous of avoiding the shame of exposure of illegitimacy, or after infanticide, have placed the fetus in a similar position in the coffin of a woman recently deceased, in the hope of diverting suspicion from themselves. An examination of the body of the deceased woman would speedily disclose the perpetrated fraud.



The signs of abortion after the lapse of three or four weeks are as difficult to determine as in the living. In a recently deceased woman they are as follows: If the abortion has occurred at a very early period (first or second month), difficulty will be encountered in differentiating the condition from that which accompanies menstruation; if a few days have elapsed since the delivery, the parts will have resumed much of their usual condition. Curettage of the uterine cavity and microscopic examination of the débris will be the most reliable proof of delivery, together with a slight increase in the size of the uterus. The greatest of care must be exercised not to injure the organ when removing it, and thus further complicate the process of examination. It should be closely inspected for punctures or laceration the result of attempts at criminal abortion. Accurate measurements of the length and breadth of the cavity should be made, and the increase over the normal noted. After the third month the placental site can be distinguished as a raised and reddened area of an inch or more in diameter, and placental débris can be secured. The mere presence of a blackened and nodulated condition of the uterine mucosa does not signify criminal abortion; such a condition is present after spontaneous abortion as well. The presence of corpora lutea should be noted, although it will be remembered that no medicolegal significance can be attached thereto.

As certain drugs and poisons, known popularly as abortifacients, are frequently given for illegal purposes, the examination of the woman's body would not be complete without a close inspection of the stomach, bowels, and kidneys for lesions resulting from these irritant remedies. Caustics and other irritants have occasionally been injected into the womb for the purpose of inducing abortion, and the vagina should be examined to discover the traces of such a substance. The mere fact that, prior to her death, the woman had manifested the symptoms of septicemia is not conclusive evidence that a criminal abortion has been performed, although evidence of a strongly circumstantial nature. Septicemia not infrequently follows an abortion occurring spontaneously.

In cases of women dying during the menstrual epoch there will be noted more or less congestion of the pelvic viscera, some swelling or edema of the endometrium, and a general softening of the uterine substance. This is quite distinct, however, from the changes noted after abortion.

The signs present in the dead body of a woman **recently delivered at term** will, as may be expected, be very pronounced. The external genital organs will be turgid and swollen, and will present the usual abrasions, contusions, and lacerations. The vagina will be dilated, with smooth and relaxed walls. The uterus will be found large, flaccid, and hemorrhagic; it will measure from 9 to 12 inches in length, and from 6 to 8 in width; the internal os will be patulous, and the cavity will contain decidual matter and clotted blood. The placental site will be prominent and gangrenous in appearance, and will show the gaping orifices of the immense uterine sinuses; the cervix does not present the

normal appearance, is very thin and greatly elongated, and often presents spots of ecchymoses which are valuable diagnostic signs.

It is well to note here the size of the uterus during the varying periods of involution. By the tenth day the intra-uterine measurement is 10.5 cm.; on the fifteenth day it is 9.9 cm.; by the third week, 8.8 cm.; by the fourth week, 8 cm.; by the fifth week, 7.5 cm.; by the sixth week, 7.1 cm.; by the eighth week, 6.1 cm.; at the tenth to the twelfth week it is 6.5 cm. Seven cm. is the normal measurement of the non-pregnant uterus, so there would appear to be a physiologic hyperinvolution present for a short time after labor.

At a **remote period** after delivery, a month or more having elapsed, it is exceedingly difficult to arrive at any satisfactory conclusion. The question then would probably resolve itself into one as to parity and nulliparity, and this could be determined only by examining the size and shape of the womb. Medical science alone cannot determine this question in the dead; the history of the patient and other factors must be taken into consideration. It is well recognized that a uterus that has borne a child never regains its virginal size and weight; its walls remain thicker, and the organ is heavier, than in the nulliparous woman. The original triangular shape of the cavity is lost to a certain extent, and a rounded outline assumed. The presence of scars or lacerations around the external os, while strongly suggestive of a previous labor, are not proof positive, as they may have resulted from some operative procedure, such as dilatation of the canal.

**Feigned Delivery.**—Occasionally, for nefarious purposes, such as extortion, compelling marriage, or disinheriting those who have rightful claims to an estate, or simply as a result of hysteric aberration, a woman will claim to have recently given birth to a child. An examination by a medical expert will expose the fraud without any difficulty, save in the possible instance of a woman who has recently given birth to a dead child, and who has attempted to substitute for it a living one. In such a case the measures recorded under child substitution must be resorted to in order to unmask the deception. Very rarely, for the purpose of instituting blackmail, a woman will feign an abortion. In such cases the assumption of great prostration, together with some genital irritation, would be the features looked for. A close vaginal and mammary examination would be sufficient to expose the imposition.

**Unconscious Delivery.**—In association with a suit for infanticide it is quite possible for the question to arise, Can a woman unconsciously give birth to a child? Many a woman has claimed that she was unaware of the process of parturition, and that through her ignorance of the state of affairs the life of the infant was lost. It is well recognized that unconscious delivery is possible, though rare, during profound sleep, during a state of coma or syncope, in an apoplectic, eclamptic, hysteric, or asphyxiated woman; and under the influence of an anesthetic, narcotic, or intoxicating liquor. A woman suffering from paraplegia might readily give birth to a child without experiencing any painful sensation, since the uterine action is absolutely independent of

volition. During ordinary sleep a primigravida is not likely to be unconscious of her pain; a multigravida may occasionally confound a labor expulsive effort with a desire to evacuate the bowels, and thus may drop her child down a privy or into a commode, with disastrous effects to the fetus. Such an accident requires a statement of all the facts from the female in question. After the accident has happened the woman is not ignorant of what has occurred, and if she claim to have no knowledge of the affair, her guilt would be assumed. Of course, delivery in a moribund woman would be accomplished either artificially or spontaneously without her conscious volition. Some women who are blessed with a roomy pelvis and strong expulsive powers accomplish their delivery with a minimum of pain, or even without any sensation of suffering, and in such cases an unconscious delivery must not be conceived as impossible. The same is true of women who have given birth to many children, whereby there has resulted marked and permanent dilatation of the lower birth canal. If the woman claim that she was unaware of her pregnant condition, such a claim would indicate either unusually deficient cerebration or a deliberate attempt to conceal her crime, especially if she were a single woman.

**Concealment of Birth—Concealed Delivery.**—For obvious reasons—infanticide or the preservation of reputation after illegitimacy in the marital relation—certain women will endeavor to conceal a birth in this and other countries. The law in America varies, however, and each case must be considered and construed under the law existing where the offense is committed. In some states if the child be still-born the concealment of its birth is no crime. In New York and other states the knowledge obtained while attending a woman in confinement is privileged, and testimony concerning such matters is prohibited. As stated,<sup>1</sup> "If any woman shall be delivered of a child, every person who shall by any secret disposition of the dead body of the said child, whether such child died before, at, or after its birth, endeavor to conceal the birth thereof, shall be guilty of a misdemeanor." The real guilt lies not so much in the concealment of the birth, as in the concealment of the body, the law requiring that the bodies be given legitimate burial. It is not necessary, from a legal point of view, that the body of the child be produced to prove a case of this kind. The proofs of the delivery are obtained by a physical examination of the mother's body. In England the death of the child must be proved in order to establish the guilt of the mother. Only in case the living child whose birth had been concealed should die before the birth was registered would the woman, according to the English statute, be open to legal action. A secret disposition of the body at once proclaims the woman guilty and those who are associated with the deed.

<sup>1</sup> 24 and 25 Vict., c. 100, Sec. 60.



# BIRTH AND LEGITIMACY

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WHILE the state establishes the general rules for determining whether any given birth is legitimate, yet in determining the facts and applying these rules in any given case the legal profession must often call upon the medical.

"A legitimate child," says Blackstone, "is he that is born in lawful wedlock or within a competent time afterward. '*Pater est quem nuptiæ demonstrant*' is the rule of the civil law; with us, in England, the rule is narrowed, for the nuptials must be precedent to the birth." Here one of the presumptions is noted that makes in favor of legitimacy and the peace of families, and diminishes the possibility and necessity of litigation and expert evidence. The rules for legitimacy vary with the jurisdiction, but it may be said that, in general, the parents of an illegitimate child legitimize it by subsequent intermarriage after or before its birth; and also that the ancient rigor of the law against the offspring of void and voidable marriages, declaring them bastards, is now pretty generally relaxed, the child of such marriages being sometimes legitimized absolutely, sometimes under the name of the parent who has entered the marriage in good faith. The laws and precedents of adoption will often give relief in cases where legitimization is impossible.

In divorce cases, also, in which the wife is defendant, in jurisdictions where the court may pass on the legitimacy of her children, it is still often necessary to overcome a strong presumption to prove illegitimacy. In general, the husband of a woman who gives birth to a child is presumed by the law to be the child's father, unless he is able to prove the contrary. In every case, even when these matters may be gone into to the greatest extent, the offspring is considered legitimate unless non-access of the husband is proved—that is, if access of the husband is possible, intercourse is presumed.

On the continent of Europe a formal written declaration of the birth of a child must be made before the authorities, and this declaration shows whether the birth was legitimate or not. In all states where the registration of births is required this is also true.

A bastard is one born out of lawful matrimony or after a competent time following it; or in a case in which it is physically impossible that offspring should result from a given marriage. In divorce and annulment cases these questions may form issues subordinate to the

main issue, and are decided by the court on the evidence offered as to possibility, capacity, access, etc.

As to posthumous children: If a child of a woman marrying shortly after one husband's death could be lawful child of either of two husbands, as far as the ordinary course of events is concerned, he could, under the common law, choose either one as his father. Marriages of this sort are forbidden by codes on the continent of Europe; in the United States and in England the paternity in such cases is purely a matter of evidence. As noticed in other connections elsewhere, access between the spouses is presumed until disproved. "Access" is co-extensive in nearly all cases with "cohabitation," even when there is a formal voluntary separation between the parties.

The proving of paternity, the proof of legitimacy, and the proof of the birth of a legitimate child, living no matter how short a time, are often matters of great moment affecting the descent of real and the distribution of personal property, and radically altering devolution of estates; according to the fact involved, estates may vest and the course of inheritance be changed. In the United States such questions are of less importance, as our laws do not permit the entailing of property or recognize primogeniture. In England and on the continent of Europe however, much may depend upon medical evidence in regard to these questions. "By the courtesy of England" if a married woman who has independent property dies after having given birth to a living child, her husband will be recognized as a life "tenant" of that property. But if such a woman has never borne a child, the property will pass to her heirs-at-law. The establishment of the fact of whether a child has been born alive under these circumstances becomes a matter of expert medical evidence. This is likewise the case when there is a question of feigned delivery or of substitution. The whole body of legal relations between parent and child may arise or not according to proofs that a woman has given birth to a child or to a particular child.

In legal proceedings as to birth or legitimacy the expert gynecologist is called upon, therefore, for opinions—sometimes based on facts or inferences in a particular case, sometimes upon hypothetic cases predicated—as to pregnancy, its inception, duration, and termination; and also as to feigned pregnancy, as to access of the husband to the wife, viability of newborn infants, delivery, etc. He is also required to support such opinions by citing facts as to the age, condition of the organs, and the general *indicia* of the real or hypothetic cases in dispute. Thus, pregnancy is in some way an element in almost every case coming under this general title.

The age of the supposed mother is rarely a question in dispute, but occasionally medical opinion may be sought as to whether a given woman because of extreme youth or advanced age could have given birth at the time alleged. The child-bearing period has no legal limits so far as we are aware, and varies greatly in different races and climates. Women who have passed the menopause are commonly supposed to be incapable of bearing children, but reports have been recently published

of cases where women have conceived and borne living children after menstruation had been suspended for a considerable period—six, and even twelve years.<sup>1</sup> Pregnancy may occur in young girls who have never menstruated, many cases being found in medical literature. One recently occurred in England where a girl of fourteen gave birth to a healthy infant.<sup>2</sup> The father of the infant was a boy “of about the same age.” It at times may be a puzzling matter for a medical man to decide the age limits beyond which child-bearing is a physical impossibility.

Disregarding, for the present, investigations in the criminal courts as to abortions and infanticide, treated elsewhere, the following classification of the general legal and medical questions above set forth may be roughly formulated:

1. *Was this Living Child, Asserted or Conceded to Be the Illegitimate Child of this Mother, Begotten Upon this Mother by this Alleged Father?*—This is the query in bastardy cases proper, and a main incident in suits based on seduction, often blackmailing in character. The child may be born or be an unborn fetus of any age. The answer must be proved affirmatively, “Yes.” The object of the proceedings is to ascertain if the person accused is the father of the child, in order to prevent the latter from becoming a public charge. This is done by obliging such father to give bonds—“bastardy bonds”—for the child’s support under an “order of affiliation.” The subject of bastardy will be treated in a separate paragraph. Medical subjects principally involved are pregnancy and delivery, real and feigned; access; capacity.

2. *Did this Husband, who is Prima Facie Presumed by Law to Have Begotten this Child—Concededly the Child of This the Wife of the Said Husband—Actually Beget this Child On Said Wife?*—This is a question that comes up as incidental to the main issue in divorce suits. The answer must be proved in the negative, “No.” The result is, unless there is some statutory relief for the innocent child, illegitimacy. Here the medical questions involved are access, pregnancy (antenuptial and postnuptial, postdivorce), physical capacity.

3. *Is this Child, Alleged to Have Been Given Birth to by this Wife (or Woman), and Also Alleged to Have Been Begotten On Her by This, Her Husband (or by this Man), Actually Her Child by Him?*—Here we have the query in cases of substitution, of supposititious children, or disputed heirship. Substitution may also be attempted to effectuate a blackmailing scheme through an affiliation proceeding; or it may be resorted to in connection with actions to establish courtesy. The medical investigations necessary under this head are as to the symptoms and signs of pregnancy, indications of feigned pregnancy, feigned delivery, age of child, physical capacity.

4. *Was this Child, a Fetus Concededly Legitimately Conceived, Born*

<sup>1</sup> Childbirth after apparent menopause: L. H. Nowack, Wisconsin M. J., July, 1912, 11 : 59; and L. Buckle, Jour. Amer. Med. Assoc., Aug. 13, 1910, 55 : 568.

<sup>2</sup> Pregnancy occurring in child aged fourteen years: Jas. Barnet, Brit. Jour. Dis. Child., 1918, 15 : 119.



*Alive During the Life of Its Mother?*—The claim of courtesy may depend upon proof of the answer to this interrogatory, and the devolution of estates under the statutes of descent and inheritance or under some instrument may be entirely changed in consequence. The English law requires that the child be *born alive during the lifetime of the mother*. This question practically never arises in this country, but might easily have done so in a case reported from Canada in 1921, where an eight and a half months' child was delivered by podalic version ten minutes after the death of the mother from eclampsia, and removed from the hospital in good condition at the age of eight days.<sup>1</sup> In New York divorce for the husband's fault, or deed or devise of the wife, may now defeat this "courtesy," and similar modifications of the rule have been made in other jurisdictions.

**Pregnancy, Access—Presumptions of.**—The uncertainty among authorities as to the exact time after insemination at which pregnancy begins, and as to the precise manner of its causation; the extreme variations of its natural duration, and the possibility of shortening it in different degrees—all present problems of great interest to the expert.

As to the first necessary element for the legitimate pregnancy of a wife—namely, the access of the husband—inasmuch as the law has established that non-access must be proved on alleging illegitimacy of offspring, therefore, as has been shown, the presumption is generally conclusive of access unless total and indisputable absence of opportunity of access appears; whence it follows that pregnancy which could be caused by such presumed access is also presumed until disproved. Thus, these two presumptions fortify each other. Even antenuptial pregnancy is presumed *prima facie* to be the result of the cohabitation of the spouses before marriage. Nay, almost the slightest opportunity for intercourse between spouses is equivalent to access conclusively presumed, so that access and intercourse are practically synonymous. Nevertheless, the case might arise in which the impossibility of access resulting in intercourse would become a medicolegal question.

Access—*i. e.*, intercourse—which might have resulted in fructifying an ovum may be presumed to have occurred on the last day of an opportunity for it, if such presumption could harmonize with the date of delivery; yet the court will not, if it attacks legitimacy, hear argument to support a contention that the ovum was not impregnated on the first day of access—intercourse.

Again, a child born within a competent time after access—*i. e.*, after the last day of the life of the husband, or after the last day before the spouses were divorced—is *prima facie* legitimate; and the competent time may be made, in an attack on legitimacy, to begin at an early date by proving non-access or incapacity for a certain period before death or divorce. In the case of non-access before death, the character of the disease of which the husband died is an important consideration. This *competent time* is the subject of expert evidence in this country.

<sup>1</sup> Postmortem Delivery, F. J. O'Connor, Canadian Med. Assoc. Jour., 1921, 11, 460.

In France it is determined by law that a child delivered within three hundred or three hundred and one days after death or divorce is legitimate. Similar rules prevail elsewhere on the Continent. For instance, if there are access and ability between the one hundred and eightieth and three hundredth day before delivery, or delivery between one hundred and eighty and three hundred days after access and ability, a child thus born is held to be legitimate. Continental countries also forbid marriages of widows within a given period (in France one year) after the death of the husband. As the authorities differ extremely as to the period of gestation (Winckelman placing the proportion of cases of more than three hundred days' gestation at 6.8 per cent.), and as the presumption of legitimacy raised by proof of the access of the husband with a *competent time* is hard to overcome, it can readily be imagined that great opportunities are offered to unscrupulous women to give birth to heirs not begotten by their postulated husbands.

The average duration of pregnancy has for many generations been considered as covering two hundred and eighty days, with a possibility of varying all the way from two hundred and forty days to three hundred and twenty days. During the Great War European obstetricians found many opportunities for making calculations, as the brief furloughs of soldiers enabled the date of fruitful intercourse to be established with exactness. It is noticeable, however, that the most careful tabulations gave practically the same results as the earlier and less precise calculations. That pregnancy may be prolonged far beyond the usual period admits of no doubt. A case where a living child was born a full year after the last access of the husband "who had been called up to the Forces," and nine months after a diagnosis of three months' gestation had been made, was quite recently reported.<sup>1</sup> It is now generally conceded that it is impossible for a viable child to be born less than two hundred and ten days following conception, although conception is not necessarily coincident with the reception of the sperm, as medically it has been established that several days may elapse between insemination and conception. The law, however, does not make this distinction.<sup>2</sup>

In the case of the State of Iowa *vs. Blackburn* (1907) the prosecuting witness had given birth to a child two hundred and ninety-nine days after her alleged rape by the defendant. While the court held that the paternity of the child was not a fact necessary for the state to establish in order to make out the crime of rape, the birth of a child within a possible period of gestation after the alleged connection would tend to corroborate the testimony of the prosecutrix as to the fact of such connection. Medical opinion was sought as to the possibility of pregnancy continuing for two hundred and ninety-nine days.

It is therefore obvious that investigation of the signs of pregnancy

<sup>1</sup> Gestation Prolonged to Twelve Months, J. T. Roger Miller, Practitioner (London), Jan., 1916, 100, 94.

<sup>2</sup> Duration of Pregnancy from the Medicolegal Standpoint, C. Ruge, Arch. f. Gynäk., 1920, 114, 1.

at its different stages may become necessary in overcoming legal presumptions, particularly in cases where it is pretended that pregnancy existed between certain dates, and where it is being simulated at the time of investigation. Such investigation—*i. e.*, as to recent pregnancy and its character—is equally important in questions of viability already discussed. But when we come to a consideration of the signs and symptoms of real pregnancy, the evidence of simulated pregnancy, or the subject of the viability of a fetus, the legal profession must turn the matter over to the medical; and for a consideration of these points the reader is referred to the text-books on obstetrics and gynecology.

The efforts of the French government to increase the birth-rate in that country have given rise to special legislation in regard to prenatal rights and care. A law promulgated June 17, 1913 provides that pregnant women may leave their occupation without warning and without being liable to forfeiture of pay, either in industrial or commercial establishments, public or private, professional or charitable. It is forbidden to employ women within four weeks following their delivery. Any French woman without resources, who is constantly employed by another as a workwoman or domestic, has a right during the period preceding and following childbirth to a daily allowance. Before the birth the applicant must produce a medical certificate that she cannot work without danger to herself or child. The maximum allowance will be for eight weeks, during which she must refrain from the exercise of her habitual profession and observe all necessary rules of hygiene for herself and the infant, conforming to instructions given her by the Bureau of Assistance; if placed in a hospital one-half of the allowance only is given.<sup>1</sup> Similar legislation is now being advocated in this country.

In the United States the medical profession is not infrequently called upon to decide questions of injury to pregnant women who have instituted suits of damages, and at least two cases have been tried in New York State where an infant sued through its guardian for damages sustained prior to its birth. In Kentucky a young pregnant woman was injured while traveling upon the Louisville Railway. She gave birth to the child at full term, but later underwent an operation which in the opinion of the physicians and surgeons attending her rendered her sterile and incapable of having any more children. On the strength of this medical testimony she received an award of \$7000. Six months after the award she gave birth to another living child; upon learning this fact the defendant railroad company sought and obtained a new trial. In this case the surgeons performing the operation testified that they had removed both fallopian tubes, the entire left ovary, and part of the right ovary. A surgeon retained by the defendant railway company accepted this statement, and upon it based his opinion that the plaintiff had been rendered sterile.<sup>2</sup>

In cases where an infant sues for damages sustained *antepartem*

<sup>1</sup> Paris Letter, Jour. Amer. Med. Assoc., July 12, 1913, 61, 154.

<sup>2</sup> Anshutz vs. Louisville Ry. Co. (Ky.), 154, S. W. R., 13.



the medical question to be decided would be whether the child's condition were due wholly or in part to the injuries alleged to have been received by the pregnant mother. In the two cases of this kind tried in the courts of New York State the decision was first against, and second for, the award of damages.<sup>1</sup> In the first case all medical evidence was ruled out, the decision being that the defendant railway company did not know of the existence of the unborn child, did not contract to carry it safely, and therefore, was not responsible for injury to it. In the second case, where the mother fell into an open coal hole upon the sidewalk, upon medical testimony that the child would be deformed for life because of prenatal injuries damages were awarded.

Most of the states now require the registration of births by the medical or other obstetric attendant, and numerous legal actions have been reported against physicians who failed to comply with the law in this respect. The value of an exact birth record needs no demonstration, and is fully recognized by the medical profession, and failure to file the required certificates has usually been attributed to unintentional negligence and leniently dealt with by the courts. In the case of an infant dying shortly after birth the filing of a death certificate giving the date of birth does not fulfil the requirements of the law in New York and most other states.<sup>2</sup>

<sup>1</sup> *Nugent vs. Brooklyn Heights Ry.*, 139, N. Y., Supp. 367; and *Drobner vs. Peters* (N. Y.), 184 N. Y., Supp. 337.

<sup>2</sup> *Liability for Failure to File Certificate of Birth*, Dept. of Health, City of New York *vs. Dunn* (N. Y.), 129 N. Y. S., 29.

# ABORTION

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By abortion is understood the expulsion of the product of conception before twenty-six weeks' gestation or viability. Premature labor refers to the birth of the fetus after it is viable, but before the normal end of pregnancy. Miscarriage is a popular term designating the emptying of the womb at any time before labor, and has no scientific meaning.

By criminal abortion, or miscarriage, we understand the bringing about of the expulsion of the ovum before it is viable, for an improper purpose. By therapeutic abortion or miscarriage is meant the premature termination of pregnancy to save the life of the mother. The attempt to destroy the impregnated ovum is held to be equally guilty with the actual accomplishment. The indications for therapeutic abortion must be carefully determined by physicians of acknowledged competence, and this procedure is never employed unless other means for preserving the life of the mother have failed. The induction of premature labor, unless for sufficient reason, is strongly to be condemned, but the law seldom has occasion to deal with this offense. So soon as pregnancy is discovered, if it is determined to put an end to it, this will be done before the mother's condition is noticeable and before the fetus is viable.

## THE CAUSES OF ABORTION

Royston, by statistical study of the subject, finds that more than 20 per cent., probably over 25, are induced; of these, 60 per cent. result in more or less permanent sterility. The most dangerous are those produced by the midwife, next those by the patient herself, and finally, those produced by the physician. Nothing will deter a woman from attempting to interrupt her pregnancy when she has once made up her mind. In 25 per cent. a positive Wassermann reaction was obtained; however, less than one-third of syphilitic women gave any history or showed any physical signs indicative of the disease, and only by routine Wassermann reactions can syphilis be detected in obstetric cases. Syphilitic women abort in more than 60 per cent. of pregnancies at any and all periods.

Renal deficiency interrupts pregnancy only when the condition is sufficiently bad to produce symptoms, such as rise in blood-pressure, headaches, insomnia, vague discomfort, irritation of the bladder, and a drop in the secretory power. When these indications are present,

pregnancy is threatened with interruption and vigorous treatment may often be successful. Renal deficiency will produce interruption in pregnancy at any period of gestation. Although it is not an infallible index, the phthalein test is of great value. Of all women who have aborted, 65 to 90 per cent. will show some pathologic lesions in the genital organs. When a state of malnutrition produces interruption in pregnancy, it is usually but a symptom of some greater underlying condition, such as syphilis, impairment of the heart, lungs, or kidneys.

**Streptococcus Infection as the Cause of Spontaneous Abortion.**—Curtis has isolated the streptococcus as the direct cause of abortion in several cases which he reports. He isolated the streptococci from the urine of a mother whose child was born dead, from the placenta, and also the heart's blood of the still-born child. Intravenous inoculation of pregnant rabbits was made producing abortion or absorption of the fetus, while the streptococcus in pure culture could be isolated from the mother's uterus. It is thought that chronic streptococcus poisoning may account for cases of repeated abortion where no other cause can be detected.

**Efforts to Produce Abortion Through a Mistaken Diagnosis of Pregnancy, and Their Result.**—Liebecke has collected 44 cases in which women, supposing themselves to be pregnant, had efforts made to produce abortion. The methods employed consisted in the introduction of sounds and various objects into the uterus, and injections of different materials. A very considerable mortality and morbidity resulted from septic infection or from the entrance of fluid into the blood-vessels.

Unquestionably, this interference is practised more commonly than is generally supposed. In the writer's experience a young woman, married, was taken by her mother to a criminal abortionist because disturbances of menstruation had given rise to a suspicion of pregnancy which was not desired. The abortionist introduced some object, probably a sound, within the uterus with sufficient violence to cause considerable hemorrhage. As the hemorrhage persisted, the patient was put under the care of reputable physicians at her home, a history of incomplete abortion was given, and by these physicians dilatation and curetting was practised. Shortly after she became violently ill with infection, when a change in her medical attendants was made, and a consulting staff summoned. Examination of the blood showed hemolytic streptococci, and the patient died of virulent sepsis. No evidence whatever that she had been pregnant was discovered.

Stein draws attention to a very dangerous class of cases where the woman, believing herself pregnant, attempts to produce abortion although pregnancy may be absent, and also cases of attempted abortion in which the uterus is empty, but in which there is an ectopic gestation. The high mortality rate, 43 per cent., seems to be caused by the determined effort with repeated interference to bring about abortion. He describes the case of a multipara, aged forty-three, near menopause, who thought a six weeks' interruption of menstruation



was due to pregnancy, and attempted to produce an abortion. She introduced an alum stick into the uterus and this was followed by a chill and fever. There was persistent vomiting and pain in the abdomen, and a considerable amount of bloody discharge. Three days after this the patient was in a serious condition, the abdomen tender, distended, the uterus slightly enlarged and extremely tender, but there was nothing abnormal about the perimetrium and adnexa. A diagnosis was made of infected, incomplete abortion, and under careful precautions the uterus was emptied. A small amount of tissue with fetid odor was removed. The night following the operation the temperature rose to 105.6° F. and three days later the patient died of general septic peritonitis. A postmortem with microscopic study of the tissues showed no signs of an existing pregnancy.

The case is also quoted in which a woman, aged thirty-two, with one child eight years old, greatly feared pregnancy because her child had been born by the use of forceps on account of a contracted pelvis. When a very scanty menstruation occurred the patient believed herself pregnant. She went to a doctor, who made repeated intra-uterine injections, which were followed by severe illness and left-sided perimetritis. A more complete examination showed that the pelvis was filled with thickened exudate. Under prolonged treatment the patient made a partial and tedious recovery.

Cases are also cited in which women supposing themselves pregnant and attempting to produce abortion had pushed various instruments through the vagina into the pelvic or abdominal cavity. Cases are cited also of ectopic pregnancy, producing severe and sometimes fatal hemorrhage, and in other cases infection was caused.

While many of these patients become infected and are very ill, an extraordinary tolerance is sometimes shown to the introduction of foreign bodies.

### CRIMINAL ABORTION

In estimating the frequency of criminal abortion we are at once met with the difficulty that only those cases detected or brought to trial are available for statistics. Cases in which criminal abortion is followed by no complications are seldom made public. Phillips<sup>1</sup> endeavored to ascertain the frequency and result of criminal abortion by questions sent to practising physicians. Seventy-five physicians estimated that throughout the country in which they practised 63.5 per cent. of abortions were criminal. The average death-rate was reported as 2 per cent. The same observers estimated that 49.5 per cent. of those women having criminal abortion remained chronically ill as a result. Comparing these figures with the results of spontaneous abortion, we find the mortality of the latter to be 1.75 per cent., while the chronic disability was 38.5 per cent. These results were obtained from physicians practising in small towns and in the country, and not from specialists in large cities. Storer, of Newport, R. I., has drawn repeated atten-

<sup>1</sup> Transactions Maine Medical Association, 1896, vol. xii.

tion to the progressive decrease in population in some portions of New England, which he ascribes largely to criminal abortion. From the Report of the Special Committee on Criminal Abortion<sup>1</sup> we learn that from correspondence with 100 physicians the Committee estimated that one-third of all pregnancies throughout the country end in abortion. This is estimated at not less than 100,000 yearly. A large number of these are criminal abortions, from which the Committee estimated that 6000 women die yearly. Rentoul<sup>2</sup> quotes the returns for twelve months of still-birth in Great Britain as being 17,335. This did not include Scotland and Ireland. It is estimated that of legitimate pregnancies, one in twenty ends in still-birth, and of illegitimate, one in ten.

Bertillon reports that the proportion of illegitimate still-births to legitimate still-births is 193 to 100. In Denmark twice as many still-births occur in illegitimate as in legitimate pregnancies. The records of city hospitals in the United States show numerous cases of puerperal sepsis following criminal abortion, and in spite of the difficulty in obtaining accurate statistics, it is evident that criminal abortion is very common.

The perpetrators of this crime are the patients themselves, midwives, professional abortionists, and physicians. The patient herself usually learns a method of direct interference with the uterus from an abortionist, and if this results successfully, she proceeds to apply it herself when another occasion offers. At most drug stores medicines supposed to produce abortion are on sale, and many nostrums advertised to correct female irregularities are made, bought, and used to produce abortion. Midwives often advertise private lodgings for young women in trouble. When the patient enters such an establishment she is usually supposed to come for the purpose of procuring abortion. This is done either by the midwife or by a professional abortionist summoned for the purpose. Those who make a business of procuring abortion vary greatly in education and technical skill. Some understand aseptic precautions, while others are ignorant of the rudiments of surgery. They usually have offices to which the patient goes, submitting there to some operation, so called, and returning to her home to await the result. Disreputable physicians, while not avowedly abortionists, often have a considerable practice of this sort. Under a false diagnosis, usually of some form of pelvic disease, the womb is dilated and the ovum removed by curetting, or a sound is repeatedly introduced until the contents of the uterus are expelled. Abortifacient drugs are often prescribed, and also injections which the patient may administer to herself.

In the *Zeitschrift f. Geburtshülfe und Gynäkologie*, 1915, Band lxxvii, Heft 3, Benthin contributes a paper upon the subject of criminal abortion, especially in the region of East Prussia. This paper was just at the point of completion in June, 1914, at the breaking out of the war, and its publication has been hindered on this account. The

<sup>1</sup> Transactions Michigan State Board of Health, p. 165.

<sup>2</sup> British Medical Journal, 1895.

statistics available indicate the frequency of criminal abortion as 0.55 per cent. to 0.194 per cent. Some estimate that of all premature births at all stages of pregnancy from 70 to 80 per cent. are the result of direct interference. If the records of hospitals are consulted, the writer in going over the records of ten years' polyclinic service in 4376 operations, found 26 of criminal origin. The Dutch statistics vary from 7 to 33 per cent. in accordance with the experience of different obstetricians. The Russian reports indicate a comparatively high percentage—75 to 90—with the estimate that in Petrograd one-third to two-thirds of premature births are the result of direct interference. American statistics are quoted to show that 35 per cent. of all pregnancies are purposely interrupted. The reports of Olshausen's Clinic gave 80 per cent. of operations as criminal, while Dolèris, in Paris, reported 50 per cent.

References to the literature of different countries vary greatly in the frequency of criminal abortion. There are quoted the statistics of Baltimore, 15 per cent. So far as criminal prosecutions go, in the year 1911, 1028 persons were arrested in the German Empire charged or suspected to be guilty of crime. In the district whose center is Königsburg there were but 31 prosecutions for this cause. Comparing the country and the town, criminal abortion is much less prevalent in the country than in the city. As regards the social state of the woman, statistics show that it is more frequent among married than among unmarried women. An analysis of 200 cases shows that two-thirds of criminal abortions are brought about by the use of instruments, and the remaining one-third by douches, baths, or use of the tampon, tight lacing, or taking drugs, among which were camphor, ergot, ammol, various abortive agents, pills, and green soap. When the effort is made to ascertain who produces criminal abortion, obviously someone accustomed to using obstetrical instruments must be the one to employ them for this purpose. In 14.8 per cent. of the cases a midwife was proved to have done the operation or aided and abetted it.

When the question of morbidity and mortality is considered it is at once seen that more women die from criminal abortion than from childbirth and its complications. Peritonitis is the most common cause of death and is responsible for more than half the fatal cases. General septic infection kills about one-fourth. The remainder perish from embolism, pneumonia, or some other incidental infection. The statistics of morbidity from different clinics vary greatly. From 3 to 30 and 40 per cent. have more or less serious illness after criminal abortion.

Many of the complications which arise in these cases are caused by wounds and injuries to the pelvic organs, perforation of the uterus, tears of the cervix, injection of air or fluid into the blood-vessels, the passing of catheters or sounds into the bladder or the abdominal cavity, or the taking of poisonous drugs may produce lesions of greater or less severity.



The writer makes an effort to estimate the reason for which criminal abortion was performed. In about one-third the cases the social surroundings of the patient were not satisfactory, and evidently the expense of children could not be borne and a supposed social standing still maintained. In more than one-fourth of the cases the parents had as many children already as they could support. In one-fourth of the cases the parents did not propose to be inconvenienced by children. In 13 per cent. unmarried women naturally feared the shame of illegitimate pregnancy. In 4 per cent. the mother was ill from some other cause, such as tuberculosis, middle-ear disease, syphilis, weakness, or complications connected with pregnancy, while in a small percentage of cases the mother was afraid that the child would not be healthy or that she herself would die during labor.

The writer goes at some length into a discussion of what can be done to prevent criminal abortion in Germany, and he believes that a very concerted effort should be made in this direction, and that intra-uterine pessaries and intra-uterine syringes should not be commonly within reach of the public. So-called private maternity hospitals must be strictly supervised lest they become centers for this abuse. All cases of abortion should be promptly reported to the health authorities and investigated, if suspicious. Philanthropic efforts are also necessary to improve the general condition of the population.

In nothing is the adage more true than that the unexpected may happen in cases of criminal abortion. The reviewer on one occasion removed from the abdomen of a pregnant patient, by abdominal section, a dirty glass catheter filled with dried urine. The woman had forced this through the wall of the uterus just above the internal os, and had lost it in the abdomen. Bacteriologic examination of the contents of the catheter showed it to be swarming with bacteria. The patient had very little disturbance following its introduction and removal; the pregnancy was not interrupted and the patient was delivered at term in hospital.

A young woman recently married and supposed to be pregnant was taken by her mother to a criminal abortionist, because pregnancy would interfere with a society season. The abortionist introduced a sound. Chill and fever followed, and when physicians were summoned dilatation and curetting were done. This made the patient worse, and another set of physicians replaced the former. The young woman died of blood infection with hemolytic streptococci, but there was not the slightest evidence that she had ever been pregnant.

The modes of performing criminal abortion are manifold. Among savages direct violence is made use of. The patient is beaten, shaken, or kicked until hemorrhage from the womb shows that the ovum is detached. The administration, by the stomach, of an active irritant has long been practised. There is no drug which is an infallible abortifacient in a healthy patient. In a recent decision the courts of England held two professional abortionists guilty of deliberate fraud because they sold drugs advertised as abortifacients. In giving judgment the

court held that there is no drug which, by its specific action, can truthfully be termed an abortifacient.

Drugs usually sold for this purpose are supposed to act in one of two ways: First, by causing the womb to contract violently, a result which follows the administration of large doses of ergot. In the second category are substances actively irritating to the genito-urinary tract, such as savin, tansy, pennyroyal, turpentine, cantharides, and others. Any substance which profoundly irritates the mucous membrane of the gastro-intestinal tract may be followed by abortion. Thus, a pregnant woman dying of arsenical poison usually aborts if life persists sufficiently long.

A very frequent method of producing criminal abortion is by direct interference with the womb or its contents. The introduction of a sound, a knitting-needle, a catheter, a piece of wire or whalebone, a glass rod, a wooden splinter or stick, a bent hair-pin, a douche cannula, or of other objects has been observed. The forcible injection of irritating fluid into the vagina or neck of the womb is often practised. Forcible dilatation of the womb is less common, because it requires more skill. For the same reason the finger is not often the instrument of a criminal abortionist.

Methods of criminal abortion vary in different countries. Bedford<sup>1</sup> describes in detail the methods employed in India. Here child marriage is common and abortion is frequently practised, while the large number of widows who are not allowed to remarry afford frequent examples of criminal abortion. Violent emetics, purgatives, and irritants are employed. Locally, abortion is produced by introducing battis or sticks wrapped with cotton smeared with a paste of pounded nutmeg, capsicum seeds, or croton seeds mixed with arsenic, sulphate of copper, and carbonate of potassium. The womb is dilated by the repeated use of these substances until the ovum is expelled or the finger can remove it. We are not surprised to know that where these methods are employed many fatal results follow.

A consideration of the methods of producing criminal abortion must naturally include the incidental results of these methods. Thus, Barnes<sup>2</sup> reports the case of a woman found dead about an hour after she had been seen in good health. She had injected a solution of acetate of lead into the uterus, producing shock which proved fatal. Although she had introduced a catheter, she had not ruptured the membranes nor wounded the endometrium. There was no history of previous ill health. She had practised abortion upon herself twelve or fifteen times previously. On two occasions she had suffered severe shock, from which she rallied slowly. Air had not been introduced into the circulation, nor had the genital canal been wounded.

At a meeting of the Gynecological Society of Breslau Marmetschke, Biermer, and Alexander discussed the subject of criminal abortion and sterility. The society had an exhibition of various forms of in-

<sup>1</sup> Edinburgh Medical Journal, 1896, No. 42, p. 422.

<sup>2</sup> Transactions Indiana State Medical Society, 1895, p. 241.

struments and apparatus designed for such use. Among the most commonly used were syringes of metal, or with rubber balls, terminating in long, thin nozzles which could be readily inserted into the uterus.

Five fatal cases were described following their use, in 2 of which death was caused by septic infection; in 1 by poisoning with carbolic acid, and in 2 through air embolism. In 1 fatal case the patient was not pregnant at all, but supposing herself so had attempted to insert the syringe into the uterus, and had injected air into the circulation, which proved rapidly fatal.

In one case a midwife had attempted to use an intra-uterine stem pessary and had applied it in such a manner that the stem had perforated the cervix, and had set up purulent perimetritis. In other cases the fact was brought out that powders and medicines supposed to be useful were sold by abortionists to induce the patients to visit their offices, where abortion was procured by interference.

The discussion of the evening was followed by the passage of resolutions by the society condemning these methods and apparatus, and instituting a crusade against them.

An interesting paper upon "Gas Phlegmon After Criminal Abortion," by Dirks, Marmetschke, and Kriebel, reviews the subject from the clinical standpoint, the medicolegal standpoint, and the work of the bacteriologist. In the latter Kriebel injected cultures of bacilli taken from these cases into guinea-pigs, finding no difficulty in demonstrating the poisoning properties of the bacilli so obtained.

In the case under discussion a young woman, who had formerly been perfectly healthy, was found unconscious in her lodging. She was brought to the hospital severely shocked and in a prostrate condition. She was first sent to the medical ward, where it was thought that she had taken some poison, although the examination of the urine was practically normal. The blood when examined by the spectroscope gave oxyhemoglobin bands. The patient was found to be several months pregnant, and was transferred to the obstetric ward, where she became conscious, and stated that she had taken a vaginal injection of carbolic acid solution. Spontaneous abortion occurred, which was followed by fever and death, with extensive formation of phlegmon in the pelvic regions.

A not uncommon result of attempted criminal abortion is perforation of the uterus. In the Transactions of the Chicago Gynecological Society, March, 1895, is described a specimen of attempted criminal abortion in which the uterus had been perforated and the fetus and placenta pushed into the peritoneal cavity. Caruso<sup>1</sup> describes a case in which a midwife introduced a strip of root into the cervical canal to procure dilatation. It was removed a week later at a hospital clinic. Hektoen<sup>2</sup> describes a case in which a rubber catheter was placed in the womb and left there several days. On endeavoring to remove it, it could not be found. In trying to secure the placenta the womb

<sup>1</sup> *Annal. di Ost. e Gin.*, July, 1891.

<sup>2</sup> *American Journal of Obstetrics*, July, 1892.



was perforated and the intestine dragged through the vagina. At autopsy the catheter was found behind the liver in the abdominal cavity. Mann<sup>1</sup> reports a case in which criminal abortion had been attempted. When the patient was brought into the hospital the intestine was found in the uterus. The patient was immediately operated upon and recovered. A similar case is reported by Alberti.<sup>2</sup> Resnikow<sup>3</sup> describes the case of a young woman who learned from a midwife to introduce a rubber sound within the uterus, leaving it for several hours until abortion occurred. Instant death followed an attempt at abortion by injecting brine and soap into the uterus in a case described



FIG. 227.—Perforation of the posterior wall of the uterus, caused by the introduction into the uterus of a probe-like instrument with the intent to produce abortion (Hofmann).

by Perrin de la Touche.<sup>4</sup> Mittenzweig<sup>5</sup> reports the case of a woman who visited an abortionist for the termination of pregnancy. The operator on three different occasions introduced a long tin nozzle and injected water into the uterus. The patient perished from septicemia. It was found that the nozzle had perforated the vagina behind the cervix, and thus infected the abdominal cavity, which was filled with pus.

<sup>1</sup> American Journal of Obstetrics, May, 1895.

<sup>2</sup> Centralblatt für Gynäkologie, 1894, No. 39.

<sup>3</sup> Ibid., November, 1893.

<sup>4</sup> Gaz. hebdom. de Méd., 1896, No. 51.

<sup>5</sup> Zeitschrift f. med. Beamte, Berlin, 1888, i, 225.

### PERFORATION OF THE UTERUS COMPLICATING ABORTION

Perforation of the uterus is a not infrequent accident which accompanies the curetting or emptying of the uterus after abortion or labor. Aschheim demonstrated before the Obstetric Society of Berlin specimens from a primipara in the fourth month, who had hemorrhage treated by the use of the tampon. This was followed by the curet and forceps, which resulted in dragging down the omentum through a rent in the uterus.

The patient was brought to the hospital and immediately subjected to operation, when a perforation in the anterior wall of the uterus as large as a silver quarter was found, and protruding through this a piece of omentum 15 cm. long. This was resected and the uterus extirpated, with drainage. Examination of the specimen removed showed the presence of streptococci and staphylococci. The patient recovered.

Thaler reports the case of a patient pregnant three months, who was curetted by a general practitioner to stop the hemorrhage following abortion. The uterus was dilated to admit a No. 12 solid bougie, the placental forceps introduced, but immediately upon withdrawal a loop of intestine was found in the grasp of the instrument. This was drawn out through the vulva, but then replaced as far as possible. The patient was immediately brought to the hospital. She was considerably shocked, and seemed to have lost a good deal of blood. Upon section the abdomen contained a large quantity of fluid blood. The ileum, near its junction with the cecum, was torn from its mesentery for 50 cm. in length, bruised, and infiltrated with blood. The vessels of the torn mesentery had been the source of the abdominal hemorrhage. The uterus had been emptied, but its posterior wall had been perforated. The uterus was extirpated, and the intestine resected for 54 cm. The bowel was closed by circular suture, and drainage was introduced through the vagina. The patient made a good recovery.

In discussion, Schauta believed that these cases are not so frequent as formerly. The profession is becoming aware of the fact that the pregnant uterus is frequently very soft and easily perforated. The majority of these perforations occur in the hands of the general practitioner who has not learned the danger of the proceeding. He believed that there was no operation so dangerous and so carefully to be undertaken as this. Usually the uterus is not dilated sufficiently and instruments are introduced blindly through a slightly dilated cervix. Frequently the practitioner does not ascertain accurately the position of the uterus. He had seen 10 cases of perforation with severe injury to the intestine. In 2 the sigmoid flexure had been pulled down; in 1 a piece of peritoneum had been torn away; and in another the broad ligament had been perforated and the ureter exposed. In his 10 cases he had extirpated the uterus in 9, with 2 deaths. When patients were brought to the hospital, or when the perforation had happened in the clinic, there had been no deaths following extirpation. He believes

that usually the intestine should first be dealt with and then the uterus.

The medicolegal aspects of perforation of the uterus by physicians is the subject of a paper by Puppe. He reports 2 cases, the first of which had a foul discharge from the vagina, and was thought possibly to be a cancer of the uterus. Accordingly, the patient was examined under anesthesia and the cervix dilated by solid dilators. When a No. 14 was introduced bleeding occurred, and the physician who operated inserted a tampon to check the bleeding, and then sent the patient to her home. Death followed shortly after, with symptoms of peritonitis.

The patient declined before death to go to the hospital.

Upon examination a large perforation was found at the internal os into the left parametrium and an extensive tear of the peritoneum near the left ovary. A piece of placenta the size of a walnut was in the cervix.

In our experience the following precautions are essential:

First, the general care which has just been outlined; then, the time of operation, the bladder should be completely emptied by catheter, while the patient is anesthetized and before any procedure is undertaken. Bimanual examination should then be made to outline an abnormal position of the uterus, the presence of adhesions, or a tumor in the pelvis. The uterus should be firmly but gently grasped with stout tenaculum forceps, and time and patience exercised in performing dilatation. Unusual resistance, followed by the immediate and easy passage of a dilator should awaken suspicion. The operator should carefully examine the uterus with a blunt-pointed dilator to be sure that he appreciates the length of the uterine cavity. Before proceeding to curet, the uterus should be explored with a large-sized, blunt dilator, or with the finger, to be sure that this is intact. Small, sharp curets should never be employed, and nothing but a spoon or large loop curet can be considered as safe.

Under no circumstances should irrigation be practised unless the operator is convinced that the uterus is intact. After curetting and irrigation the uterus should be packed with 10 per cent. iodoform gauze.

If there is reason to fear perforation the abdomen should immediately be opened, and, if no fluid has been used and the perforation is in the wall of the uterus only, and the surrounding tissues are not damaged, it may be closed with catgut sutures. Tears in the peritoneum may also be closed, but the pelvic cavity should be drained after perforation if the uterus is allowed to remain. In septic cases, if the tear is extensive, hysterectomy is indicated.

In the reviewer's experience he once perforated a septic uterus with a large blunt curet while removing decomposed placental tissue and irrigating the uterine cavity. The abdomen was immediately opened, and a rent of  $\frac{1}{2}$  inch found in the posterior wall of the uterus just above the internal os. This was closed by sutures, and a gauze pack introduced into the pelvis behind the uterus for drainage.



Although the intestine was not injured by the curetting, fecal fistula developed, probably caused by the pressure of the pack, from which the patient ultimately recovered.

Disturbance of the pulse is sometimes observed in cases in which the uterus is ruptured, and anesthetizers have reported that in these cases they were sometimes able to suspect rupture by a sudden variation in the pulse. This observation we have not been able to confirm.

Schweitzer has reviewed the literature of this subject, collecting 105 cases in all, with a mortality of over 25 per cent. This is considerably less than the mortality of rupture of the uterus complicating parturition, but it is sufficiently high to indicate the serious character of the complication.

As to the conditions which predispose to this accident, one must remember that the pregnant uterus is in a condition to be perforated readily. During its growth, as pregnancy advances, the uterine muscle is softer than normal and yields readily to a comparatively sharp instrument. In cases in which a pathologic process is present at the site of the embryo the muscular tissue at this point is more than usually soft and readily yields to manipulation. Such is especially the case where a blighted ovum has been present in the uterus and where the wall of the womb has been infiltrated with blood.

Abnormal conditions of the uterus in flexion or displacements predispose to perforation because the curve of the uterus being unusual, an instrument inserted in the customary manner will readily come against the uterine wall.

In almost every instance perforation is made by an instrument, and rarely by the hand or finger. The writer believes that it is not the instrument itself, but its improper employment which produces the accident. A proof of this is found in the fact that the finger of the operator, whether covered by a glove or not, has repeatedly perforated the uterus. The laminaria tent has frequently produced perforation of the uterus, not only during the process of dilatation but at the time of its removal. This is especially apt to occur if the tent is taken out and reinserted and pushed higher in the uterus. Greenbaum reports a fatal case of peritonitis caused in this way. When it is difficult to remove a tent it is sometimes necessary to split the anterior wall of the cervix in order that it may be safely grasped.

Hegar's solid dilators frequently produce longitudinal tears at the upper portion of the cervix, and through such a tear the finger or instrument could readily be inserted into the pelvic or abdominal cavity. Cases in which the cervix is especially narrow and constricted are always dangerous for dilatation, because the tissues may yield suddenly and the dilator go much farther and in a direction entirely different from that designed.

A small, sharp curet has long been known to be an exceedingly dangerous instrument. A young ovum may possibly be removed by such a curet but, if pregnancy has reached four or five months, it is impossible to remove it entirely by the curet and a considerable por-

tion must be left behind. The writer states that it is impossible to empty the uterus with any instruments without digital control. In other words, the finger must examine the interior of the uterus and often complete the process. He calls attention to the fact that practitioners will occasionally endeavor to perform a curettage in an office or at the house of the patient without the use of a speculum and without thoroughly exposing the field of operation.

The placental forceps and other forms of grasping instruments not infrequently cause perforation. They should never be used except under the direct control of the finger within the uterus. It is possible to grasp a portion of the uterine wall with such an instrument and to tear it away. The great part of the danger which attends this accident lies not only in the injury done to the uterus itself, but to surrounding tissues. Wounds of the intestine have been not infrequently observed, and in the writer's series 48 such cases were collected, with a mortality of 27 per cent. Of these 48, the small intestine was wounded in 25, the sigmoid flexure or rectum in 15, the ascending or transverse colon in 6, and the appendix in 2. Frequently a portion of the intestine is pulled through into the uterus and may prolapse into the vagina. When the bowel only prolapses through a rent in the uterus without a wound of the intestine the danger is naturally considerably less. There were 6 such cases in the series of the writer. In 10 cases the omentum was wounded or prolapsed, but this is far less dangerous than wound of the intestine. In 2 cases a Fallopian tube or an ovary was injured. In 1 the urinary bladder was wounded, in 1 the right ureter at its entrance was torn from the kidney so that the kidney had to be removed. The patient, however, finally recovered. Injury to the promontory of the sacrum has arisen from the same cause. It is often difficult to accurately ascertain the condition present unless the tissues can be examined by vision, and hence the necessity for care in dealing with the pregnant uterus.

To prevent this accident it is first necessary that the cervix be amply dilated. A thorough vaginal examination should precede all manipulation, and sufficient time should be taken to dilate the cervix to permit the introduction of the finger and instruments of good size. The writer prefers the laminaria tent during the first months of pregnancy, and that this should be used until the finger can be introduced thoroughly to explore the cavity of the uterus. If the tent does not seem appropriate he would tampon the cervix and vagina with iodoform gauze, which should not be allowed to remain longer than twelve hours. After the fourth month Tarnier's dilating bag has given him good results. He strongly condemns the metreurynter as a dangerous instrument.

After thorough dilatation he would employ the finger only to empty the uterus. This may, however, be a longer and more difficult process than if placental forceps or curet be employed. Anesthesia is necessary to relax the abdominal wall. If instruments are employed, it should be done with great caution and only by operators who have

had ample experience. When there is pronounced flexion, this may be considerably lessened by making firm traction upon the cervix. It is a help to note the depth of the uterus by introducing an instrument before undertaking to empty. Should a curet or placental forceps suddenly pass beyond the distance ascertained to be the depth of the uterus, the operator must know that perforation has taken place. The statement that the uterus sometimes relaxes and contracts suddenly during curettage is not to be considered as of practical value. Nor is it at all probable that the operator has introduced an instrument into the Fallopian tube.

When perforation is diagnosticated further intra-uterine manipulation must immediately cease. The writer believes that the discovery of this accident should call for consultation with an experienced abdominal surgeon.

Regarding the treatment, no irrigation of the vagina or uterus should be attempted. Septic infection will be greatly increased should this be carried out. Hemorrhage is the least dangerous and hence there should be no great anxiety to tampon the uterus and vagina. Septic infection and peritonitis are most to be feared.

In some cases absolute rest, ice-bag placed over the uterus, the administration of opium and styptics may be followed by recovery. When, under strict aseptic precautions, the uterus has been perforated by a sound, making a very small opening, such treatment may be successful. If there is reason to believe that the curet has simply passed through the uterine wall without injuring the intestine, the expectant plan of treatment may also succeed.

In 17 cases treated expectantly, 9 died—6 from peritonitis and 3 of them perished soon after the accident. In 1 case abscess in the uterine wall was found, which had extended into the abdomen and formed an encapsulated collection of pus, walled in by the intestine and omentum. Three weeks after the accident this abscess ruptured into the peritoneal cavity and death speedily followed. One patient died of general septic infection; 1 apparently did well for some time, but omental adhesions formed and the patient developed ileus and had to be operated upon, but then recovered. One patient had pelvic abscess, which was drained, followed by recovery. Another recovered, although she had peritonitis. There were 4 cases of fistula between the intestine and the uterus. This resulted from a direct injury to the intestine, and also from circumscribed abscess. One of these patients died of exhaustion, the remaining 3 recovered. One patient died of collapse. Of the 17, but 2 made uncomplicated recoveries. The mortality of the cases treated expectantly was 53 per cent. An almost incredible case is cited in which a physician had four times perforated the same uterus by the use of instruments. That wounds of the intestine may not be detected is shown by the fact that in 3 autopsies made upon these patients dying with symptoms of infection, wounds of the intestine were found which had not been recognized.

Obviously, the treatment of this accident should be by operation.



Abdominal section is by all odds the safest and most efficient. If possible, any material which has been extruded from the uterus should be removed through the uterus and the abdominal cavity cleansed as well as possible with Ringer's solution to prevent peritonitis. It may sometimes be difficult to obtain permission to perform abdominal section, simply because the uterus has been perforated, as the operation seems out of proportion to the accident. But experience shows that abdominal section is far safer than waiting or than any other method of treatment.

The abdomen opened, the question at once arises, What shall be done with the uterus? Those who strongly urge conservatism close the wound in the uterus by suture, while those who believe in radical measures will practice extirpation. If conservatism be followed, the edges of the uterine wound should be excised, so that fresh tissue is brought together and the uterus should be very thoroughly and carefully closed. The wound should be covered with peritoneum or, if this is impossible, it should be left outside the peritoneal cavity. To accomplish this, after Sigwart's method, the uterus is fastened to the abdominal peritoneum in the drainage through the abdominal wall. In attempting to cover the uterine wound with peritoneum the operator must always take a risk that the stitches may cut through and defeat the purpose of his operation. In 29 cases collected from the literature treated conservatively there were 5 deaths, 2 from peritonitis following operation, and in 3 peritonitis was present at the time of operation. Sigwart reports cases having fever and an infected uterus which recovered without peritonitis by the extraperitoneal method of treatment. If the uterus be left and is already infected, one cannot escape the danger of general peritonitis and septic infection.

In 45 cases treated by abdominal section and extirpation of the uterus there were 9 deaths. Of these, 5 resulted from peritonitis. Of the remainder, 1 was from collapse, 1 from hemorrhage, and the cause of 1 could not be ascertained. Of the 6 cases of peritonitis, in 5 this complication was present at the time of operation. The shortest time elapsing between the operation and the accident in these cases was twenty-four hours, and in most of them from forty-eight to seventy-two hours had passed.

If the results of conservative treatment and radical treatment are compared, we find that in 27 cases treated conservatively 2 died of peritonitis, 1 of sepsis, making a mortality of 11 per cent. In 36 cases treated radically, but 1 developed peritonitis after the operation (2.8 per cent. mortality).

Among the cases collected in the literature were 8 in which supravaginal amputation of the uterus was practised. Two of these died of peritonitis, 1 of whom had this complication before the operation.

In 6 cases extirpation was performed through the vagina. One of these died of peritonitis already present. One of the objections to this method of operation consists in the fact that by this method it is not possible to cleanse the abdominal cavity in any way.

Wounds of the intestine have a great influence upon the mortality of this accident. The mortality in cases not complicated by injuries of the intestine is approximately 7 per cent., while, if this complication be present, the mortality rises to 22.8 per cent. In 12 cases treated by suture and without complications there was 1 death of peritonitis (a mortality of 8.3 per cent.). In 24 treated by abdominal extirpation and without especial complications, there was 1 death from peritonitis—a mortality of 4.2 per cent. In the Leipsig Clinic 5 cases were treated by extirpation, 3 of whom had septic uteri, and 1 had a severe injury to the intestine. All of these patients recovered. In 4 cases the operation was in the beginning a laparotomy; in 2 of them it terminated by total extirpation with Doyen's method. In 1 the operation was concluded by extirpation through the vagina, and in 1 by supravaginal amputation. In 1 case the uterus was removed through the vagina. Suture of the uterus alone was not employed. But 1 case was treated without operation and made a tedious recovery. Two cases had abscess and peritonitis, and finally came to operation, with recovery.

It is evident that expectant treatment can only be employed in the simplest cases where all symptoms are favorable for an aseptic convalescence. Where there is considerable injury to the uterus and the possibility of other injury, section and extirpation is the safest method. In exceptional cases, when the uterine wound is small and the conditions favorable, suture of the uterus may occasionally be employed.

In the United States at present the majority of obstetricians are distinctly adverse to treating abortion by attempts to empty the uterus with the finger or with instruments. Experience has shown that it is impossible to remove all of the embryo and the decidua. The best results are obtained by thorough dilatation under anesthesia, preferably using the solid dilators. This is followed by packing with 10 per cent. iodoform gauze, which is done with great caution, followed by a vaginal pack of bichlorid gauze, raising the uterus in the pelvis and bringing it into normal position. This gauze may remain forty-eight hours, when it is removed and the vagina thoroughly sponged out. If tonic doses of strychnin be given, with or without small doses of ergot, the uterus will safely empty itself with the least possible danger of infection. The essentials of the treatment consist in strict asepsis and antisepsis, surgical anesthesia, sufficient dilatation, and the very careful use of the intra-uterine tampon. It is also exceedingly important that the vaginal tampon leaves the uterus somewhat raised in the pelvis and in its normal position.

Beckman draws attention to the fact that it is difficult to recognize that a foreign body has penetrated through the uterine wall into the abdominal cavity. In 1 of his cases it was a laminaria tent and in the other a bougie. In the latter case a mistake in diagnosis had been made and pregnancy was absent, and this, the writer states, is the forty-sixth case of the kind on record. As regards prognosis, it will depend in a

large measure on whether the woman conceals what she had done, or confesses the effort which leads up to the penetration. The statement of the patient must be received with a great deal of skepticism, for, as a rule, she does not know what the operator has done. In some cases the foreign body may be palpated through the walls of the abdomen, rectum, or vagina. If encysted, the body feels like a tumor. In the second case reported there were no signs of peritonitis until the fourth or fifth day, and the writer advises that the uterus be left if there be no signs of infection. A case is reported in which the operator removed a bougie from the abdominal cavity at the third month of pregnancy which progressed to term. In another case, the bougie was felt in Douglas' pouch four days after it had penetrated the wall of the six months' pregnant uterus. Abortion followed twelve days later. On the sixteenth day the patient consented to abdominal section, when the bougie was found between the umbilicus and the costal arch.

On one occasion the reviewer had under observation a multipara who had endeavored to introduce a glass female catheter into the bladder to cause abortion. The catheter disappeared, and the patient, in fright, came to the clinic for advice. On bimanual examination it could be felt in the lower abdomen and it was observed that the patient was several months pregnant. She was admitted to the hospital and, on opening the abdomen, the catheter was seen lying among the coils of the intestine. It was removed, but no point of its entrance into the abdominal cavity could be found nor any injury to the contents of the abdomen. On examining the catheter it was found to be almost filled with dried blood, mucus, and urine crystals. Examination in the bacteriologic laboratory showed many sorts of germs, including staphylococci and streptococci. The patient made an uninterrupted recovery and went to full term, and was delivered spontaneously of a living child.

The liability to a fatal result after criminal abortion may be greatly increased by the administration of substances producing congestion of the pelvic organs or by local treatment bringing about the same result. Intra-uterine injections of irritant substances are especially fatal, largely through shock. Seydel<sup>1</sup> describes the case of a woman who had taken large quantities of cooked red wine and made local applications of mustard to bring on abortion. Failing in this, she injected wood-vinegar into the uterus. The patient died in collapse after vomiting freely and having high fever and great restlessness. On postmortem examination an ulcer was found in the wall of the womb, opening into the abdomen, and extensive disintegration of the blood with jaundice and peritonitis.

Remarkable instances are on record in which foreign bodies introduced into the uterus have disappeared within the abdominal cavity. Goenner<sup>2</sup> describes a case in which a rubber catheter was broken within

<sup>1</sup> Vierteljahresschrift für gerichtliche Medicin, 1894.

<sup>2</sup> Centralblatt für Gynäkologie, January, 1894.



the vagina and part of it retained. Abortion followed, with pain and tenderness on the left side. Under the use of an ice-bag, opium, and laxatives the patient recovered. About a year afterward the piece of catheter was expelled from the rectum. Wylie reported to the New York Obstetrical Society, February 16, 1892, the removal of a glass rod from the neighborhood of the left kidney. The patient had produced an abortion upon herself by means of the rod, which had slipped from her grasp into the uterus. A tumor formed in the left ovarian region, and upon abdominal section the rod was found as described. The left tube and ovary were diseased and were removed. Duncan exhibited before the Obstetrical Society of London<sup>1</sup> a knitting-needle 9 inches long which an unmarried girl six months pregnant had thrust through her umbilicus into the uterus to produce abortion. When the surgeon in charge of the case opened the abdomen, he found the tip of the needle projecting from the fundus of the uterus. It was withdrawn with a pair of forceps, and the puncture stitched. The patient miscarried two days later, and upon the child's buttock was seen the place where the needle had penetrated. The mother recovered.

#### CRIMINAL ABORTION IN ECTOPIC PREGNANCY

Turrenne reports the interesting case of a patient who introduced a sound into the uterus and made an intra-uterine injection to bring on abortion. She suffered great pain from this interference. A watery fluid was discharged from the vagina and pain continued for several days, with the discharge of clots and of bright-red blood. The pain was bilateral, but slightly greater upon the right side. The pain gradually became more severe and was accompanied by considerable shock. She was examined a month after the introduction of the sound and colostrum was found present in the breasts, the abdomen relaxed, sensitive to pressure, the cervix softened, and the body of the uterus somewhat enlarged. The uterus was retroverted and painful upon motion. The right tube could be made out as enlarged, painful, and upon the right side of the culdesac. The tube had increased considerably in size since the first examination six days previously. There was no sign of pelvic hematoma.

A diagnosis of tubal pregnancy was made, which was confirmed by operation. The right tube and ovary were removed.

#### TWO CASES OF PURULENT PERITONITIS CAUSED BY THE INJECTION OF SUBLIMATE SOLUTION THROUGH THE UTERUS AND TUBES TO PRODUCE CRIMINAL ABORTION

Albrecht reports 2 cases of pregnancy in young women at the seventh month in which purulent peritonitis and death followed the use of a solution of bichlorid of mercury to produce criminal abortion.

Autopsy showed no evidence of rupture of the uterus or rupture of the tubes, and the fluid must have traveled through the uterus and

<sup>1</sup> Transactions, vol. xxxiv, pt. 3.

out through the fimbriated extremity of the tube. One patient had the injection given by a midwife.

No statement is made concerning the strength of the solution, but the characteristic lesions and necrosis with exudate were present in the tissues in both patients.

### AIR EMBOLISM IN CRIMINAL ABORTION

Richter draws attention to the frequency of air embolism in fatal cases of criminal abortion.

He describes the case of a woman, aged twenty-eight years, found dying in the kitchen of her dwelling, lying upon the floor unconscious and with stertorous breathing. The woman died ten minutes after she was found. Near her lay a syringe and a vessel containing soapy water. The clothing was not bloody or torn.

The husband had been absent during the evening, but testified that on previous occasions his wife had made attempts to commit abortion. She supposed herself to be three months pregnant, and had been making similar attempts. She had told the neighbors that she could bring away the embryo by injecting soapy water.

At autopsy, the most important findings were the pericardium distended and tympanitic. In the pericardium was dark, fluid blood, containing air. There was also foamy blood in the right heart, and in both ovarian arteries bubbles of air were found. There was also blood in the uterus, an embryo 6 cm. long, and at the site of the attachment of the embryo fluid blood containing air.

The syringe had a long tube, one end terminating in a douche nozzle, the other for sucking up the fluid, and between the two a hollow ball to act as the dividing portion of the apparatus.

The second case was that of a woman found dead by her husband about 11 p. m. At 9.30 the husband had gone to sleep, and the woman had said something about taking a douche. The man was awakened by the crying of the child, and found the body of his wife in an adjoining room, where she had been sleeping with the child. The body was partly clothed, the head and back upon a chair, the left leg upon another, while on a table was an irrigating apparatus, a white powder in paper, a white cup containing fluid, and on the edge of the cup colorless crystals. He placed the body of the woman in bed and tried to resuscitate her by making traction upon the tongue, while a midwife was called.

At autopsy, the pericardium contained clear, brownish-yellow fluid. From the right chamber of the heart bubbles of air could be obtained with fluid blood. There was blood containing air in the veins of the pelvis and lower abdomen. There were also bubbles of air in the uterus and in the ovum.

Examination of the powder and the crystals in the cup showed that boric acid was the substance used. The syringe was the same sort used in the first case.

The diagnosis of criminal abortion includes the diagnosis of recent

pregnancy, plus evidence of direct interference. To ascertain the former, the genital canal must be examined to detect enlargement of the uterus and the characteristic changes in that organ and in the remainder of the genital tract. Care should be taken not to omit the examination of the breasts, because the changes occurring in them in the first pregnancy are especially significant.

When recent pregnancy has been diagnosticated, it will next be necessary to diagnosticate complete or incomplete abortion. In the former the signs of early pregnancy will be present, fragments of a deciduous membrane can be obtained from the uterus, but the womb will be found empty and no portion of the ovum can be obtained. When, on the contrary, incomplete abortion is present, the signs of early pregnancy exist, and, in addition, portions of the ovum or its appendages will be found in the uterus or in the discharges from the genital canal. Among these, villi of the chorion are especially significant. If clots floating in a white basin containing cold water be agitated gently, the coloring-matter of the blood will be dissolved, and the chorion may be seen like fine white moss and readily distinguished. Its fringes are very characteristic. The amnion is less easy to recognize without careful examination, as it is very thin and transparent. If subjected to microscopic study, it is found entirely destitute of nerves and blood-vessels, and composed of delicate connective tissue and cells. The recognition of the chorion may be obscured by its cystic degeneration, but no such process is likely to mask the amnion.

The decidua has a rough surface upon one side, with loose fibers showing its attachment with the glandular tissue of the womb. The decidua of pregnancy is especially soft and filled with large ovoid cells.

The positive diagnosis of criminal abortion depends upon the detection of evidence pointing to direct interference with the genital canal. Should a patient die from an irritant poison and be found to have but just aborted, there would be a strong presumption that the abortion had been criminal and that the irritant had been taken for that purpose. In asserting that evidences are found of direct interference, it must be remembered that some congenital conditions of the cervix closely counterfeit laceration. Heintzman<sup>1</sup> calls attention to this point, and describes the lacerations caused by dilatation and curetting for chronic endometritis in a patient never pregnant. In women in whom no operation has ever been done, congenital fissures of the cervix have been observed which might mislead an inexperienced examiner. In women who suffer from chronic fungous degeneration of the endometrium with menorrhagia, the cervix may be somewhat softened, its mucous membrane everted and fissured, the womb slightly enlarged, giving the decided impression that a possible early pregnancy has just terminated.

The fact that the uterus has been subjected to considerable manipulation is no proof that an abortion has actually been accomplished. The pregnant womb has been curetted, painted with iodine, and variously

<sup>1</sup> Wiener medicinische Wochenschrift, 1896.



manipulated when pregnancy was not suspected, without causing abortion.

In young girls who have never menstruated, while no doubt may exist that the patient has been exposed to conception, it may still be impossible to prove pregnancy or abortion. Thus is reported<sup>1</sup> the case of a girl aged twelve years and five months, who was said to have aborted. She had been exposed to conception, and had been given liquor to induce abortion. She was taken with pain and a bloody discharge. On careful examination abortion could not be proved, but it was thought that, as the result of criminal practice, menstruation had come on for the first time, pregnancy having never been present.

In older women criminal abortion may be alleged when the menstrual flow follows direct violence. A case is reported<sup>2</sup> in which a woman was struck violently upon the side of the face. She alleged that she was pregnant at the time, and that on the night following the injury she aborted with a three months' ovum which was seen by no one but herself. When the case was thoroughly examined it was found that the patient had not been pregnant at all, but that menstruation had appeared soon after the reception of the injury.

The results of criminal abortion which are perceptible are permanent injury to the health of the patient or death. By far the most important factor in bringing about this issue is septic infection. While in modern times some abortionists are careful regarding the cleanliness of their instruments, many make no pretensions to asepsis, and, as a result, all degrees of infection follow criminal abortion. In cases not fatal, pelvic exudates and adhesions leave the uterus more or less fixed, permanently enlarged, the tubes and ovaries altered in structure, and the pelvic peritoneum more or less adherent. In fatal cases septic infection proceeds rapidly from the genital canal to the peritoneum. A fatal issue is often determined by severe hemorrhage. Those who have had extensive observation state that a patient has never in their experience perished from hemorrhage following abortion; but when a patient weakened by bleeding is also infected, she falls an easy prey to the poison. The pitiful efforts which these patients make to escape detection often bring them to the verge of death. During the great storm of the winter of 1898-'99 a young unmarried woman had a criminal abortion produced upon her. While bleeding considerably she walked over a mile through heavy snow, when all street conveyance had ceased, to seek shelter in lodgings. Her condition became so desperate that those about her were afraid to keep her, and reported her to the police, who brought her to the Philadelphia Hospital, where she was admitted to the service of the writer. On admission she seemed to be dying, and the most persistent stimulation was necessary for the first twelve hours after admission. In addition she had septic infection, and was not convalescent until eight months afterward.

The mortality of criminal abortion will never be accurately known.

<sup>1</sup> Samm. Gericht. Med. Ober., 1891.

<sup>2</sup> Ibid.

Tardieu estimates it at nearly 50 per cent. in a large number of cases. In a smaller series he has seen it rise to 64 per cent. Jardien<sup>1</sup> reports 34 cases of criminal abortion, of which 22 died.

The lesions of septic infection following criminal abortion are those of the most extreme and complicated type. At that point upon the uterine wall pierced by the sound of the abortionist a localized gangrene is often seen. This is well described by Winter.<sup>2</sup> In this case the uterus was not enlarged and seemed healthy, with the exception of a small circular area upon the posterior wall. Here the tissue had broken down, and the edges were ragged and gangrenous. Through this area infection had entered the abdominal cavity.

The late effects of sepsis may suddenly cause death after criminal abortion, as illustrated in the following case: The obstetric resident of the Maternity Department of the Jefferson Medical College Hospital was summoned to a young girl found in a lodging, having just expelled a four months' embryo. The placenta was shortly afterward delivered. The case was seen by the visiting chief, and the uterus thoroughly explored and washed out. The patient apparently did well for more than a week, when, following slight exertion, she was suddenly seized with rapid feeble pulse, symptoms of shock, and pain in the abdomen. A ruptured abscess, probably tubal, was diagnosticated, and the patient was brought at once to the hospital. She failed so rapidly that no operation could be undertaken. At autopsy the diagnosis was found correct. An abscess in the right Fallopian tube had burst, causing acute sepsis. Every circumstance surrounding the girl's first illness left no doubt of criminal abortion.

In addition to the usual shock following hemorrhage after criminal abortion, death may suddenly occur following an attempt at abortion from air-embolism. Examples of this sort are not rare in the literature of the subject. Mitchell<sup>3</sup> reports a case of sudden death following attempted abortion. At autopsy it was found that pregnancy of ten weeks existed. The membranes had been punctured, and the right ventricle was filled with blood mixed with bubbles of air.

A mixed infection is not uncommon after criminal abortion. Tetanus is sometimes observed in these cases. Palmer, Kuhn, Wendling, Fränkel, Leverton, Bianconi, Dizel, John, Haddon, Garrigues and Simpson, Boyd, Arnold, Baumgärtel, Weemer, Kerolfi, Peacock, and Sattler (Tübingen, 1890) report cases. The local lesions show a point in the genital canal wounded by direct interference, through which the poison entered. The constitutional symptoms were those usually seen in tetanus.

The treatment of criminal abortion requires good judgment and ample experience. The conditions present when the physician first sees the case should be accurately recorded, and a careful but gentle examination be made of the genital canal to ascertain the presence or

<sup>1</sup> *Étude Médico-Légale sur l'Infanticide*, Paris, 1868.

<sup>2</sup> *Zeitschrift für Geburtshülfe und Gynäkologie*, 1887, xiv, 242.

<sup>3</sup> *Journal American Medical Association*, February 15, 1896.

absence of lesions pointing to direct interference. If criminal abortion has been produced, each case should be considered and treated as a septic case. The uterus should be thoroughly but gently explored, and emptied and disinfected. This may be done by the finger, followed by gentle irrigation with sterile salt solution. Caution should be observed in giving these patients anesthetics, as their weakened condition may make anesthesia dangerous. If débris be removed from the uterus, it should be thoroughly examined and its character noted. If free hemorrhage is present, the womb may be tamponed, with advantage, with sterile gauze. If the womb is so large that the finger of the physician cannot thoroughly explore it, a blunt-edged douche-curet should be gently inserted, and the wall of the womb thoroughly but gently scraped and irrigated. The constitutional treatment of the patient calls for active stimulation, purgation, the use of cold over the abdomen, abundant nourishment, and surgical nursing.

In deciding upon operation in these cases care must be taken that the indications for such interference are clear. The physician must remember that he should co-operate with justice to secure the conviction of the perpetrator. Should operation be hastily resorted to without positive indication, the defense might allege, in the interests of the perpetrator, that the physician's operation, and not the abortionist, should be held responsible for the death of the patient. Cases of criminal abortion should at once be reported to the proper authorities, who will secure all possible evidence before the patient's condition necessitates an operation from which she may not recover.

The operations necessary in the treatment of this condition are those usually employed in puerperal septic infection. Thorough curetting and disinfection of the uterus under anesthesia, opening and draining pelvic and abdominal abscesses, the removal of diseased Fallopian tubes and ovaries, and hysterectomy may be indicated. Such patients are often unfavorable subjects for operation by reason of their depressed and depleted condition following hemorrhage and nervous shock. The mortality-rate of such operations is necessarily high, and the utmost resources of surgery are often severely taxed in the effort to save the patient's life. So long, however, as the patient can take food and stimulants she may recover, and the most desperate cases sometimes result in a slow and imperfect convalescence.

Many attempts have been made to lessen the frequency of criminal abortion; in countries where the decrease of population has alarmed the government, stringent measures have been taken and every inducement offered for the legitimate increase in the population. The establishment of foundling asylums has, it is claimed, lessened this evil by caring for illegitimate offspring and thus removing the temptation for their destruction. In countries having large standing armies, where the marriage of soldiers is prohibited until a certain amount of property is possessed, illegitimate pregnancy is frequent, but the hospital cares for the mother, while the government, in the foundling asylum, assumes charge of the child. However far this may be from an ideal state of



affairs, it is true that criminal abortion is not excessively frequent under these conditions. In the United States, with few foundling asylums, and with many laws of Puritan origin in effect, the temptation to criminal abortion to those illegitimately pregnant must be great. It is undoubtedly true that much can be done by intelligent philanthropy to lessen criminal abortion. Cases of illegitimate pregnancy should be taken in hand as soon as possible, and the unfortunate woman be given kind and intelligent care. She should have an opportunity to work so long as her strength permits, when she can seek confinement in a suitable maternity hospital. After her recovery, ample time should be given to her to gain strength, and the child should be kept with her. She should then either obtain employment with the child, or so arrange its care that she can see it frequently and contribute to its support. There exist in our cities societies for the aid of such cases, so that few need be without help.

A most essential reform in the prevention of abortion could be brought about by the press. There is scarcely a paper, religious or secular, which does not contain the advertisement of a means to procure abortion. In the papers of great cities the names and addresses of those who will undertake this crime are daily published and widely circulated. Few publishers have the moral courage of the late George W. Childs, who would at any time expunge from his paper an improper advertisement. Few such passed his critics, but where one had eluded their vigilance and its character became known to Mr. Childs, he instantly ordered its expulsion.

Ecclesiastic law among some sects is a distinct prevention of abortion. The Rev. Dr. Breen<sup>1</sup> sets forth the teaching of the church of Rome. No scientific procedure proved to be a therapeutic necessity is refused by the Church. The destruction, however, of the living embryo ecclesiastic authority unites in condemning. The writings of the Jesuits, the Edict of the Baltimore Council, and other edicts are of like nature.

Veit and other medical writers upon the subject have urged that physicians should report all cases of abortion.<sup>2</sup> This course is not, however, followed in many countries, and commonly only those cases are reported in which wrong-doing is suspected or in which a fatal result occurs.

This brings up the very interesting question of the responsibilities of the medical attendant in these cases. They are well set forth by Ballantyne.<sup>3</sup> Attention has been called to this subject in recent years by the celebrated case of *Kitson vs. Playfair*. Here action was brought for alleged slander in statements made in confidence regarding a person seen in consultation. The question of illegitimate pregnancy was raised by these statements. During the trial it was held that the physician was guilty, and that he should not have revealed the results of his professional observations. The case was not appealed.

<sup>1</sup> Medical Record, New York, 1895, No. 48, p. 71.

<sup>2</sup> Deutsche medicinische Zeitung, 1888.

<sup>3</sup> British Medical Journal, January 22, 1898.

The writer is indebted to Harold D. Saylor, Esq., of the Philadelphia Bar, for a statement of present law on this subject.

The law makes abortion a crime where it is brought about with a malicious design or for an unlawful purpose. In the old common law it was considered an offense, but only modern statutes and treatises have made it a crime. As in the popular sense so in the law the words "abortion" and "miscarriage" are generally held to be synonymous.

The penalties for criminal abortion include fines and imprisonment, and they are imposed not only on the man or woman who actually commits the crime, but likewise on those who aid and abet them in so doing. Under the statutes any person who with intent to cause or procure an abortion unlawfully supplies, prescribes for, administers to, or advises and causes to be taken by a pregnant woman any poison, drug, substance, or other thing, or unlawfully uses or causes to be used any instrument or other means whatever, is a principal either in the commission of the abortion or the attempt to commit it. This is true whether or not such a person is present at the time when the drug or instrument is actually used.

Because of the confidential relations existing between a physician and his patient the "rule of privilege" excludes from court trials and legal proceedings of a similar nature testimony as to their communications. This was not true at common law, but now in nearly every jurisdiction statutes forbid the physician to violate the confidence reposed in him by his patients, by testifying without the latter's consent, as to communications made to him in the confidence which the relation inspired.<sup>1</sup>

The information must be acquired by the physician in his professional capacity. He is not prevented from testifying as to matters which are not in their nature confidential. It is not necessary, however, for the physician actually to treat the patient. If he merely makes an examination with her knowledge and consent, she believing that such examination is made with a view to her proper treatment, information thus acquired is privileged.

The statute of the State of Pennsylvania which is typical of those enacted in other jurisdictions reads as follows:

"Be it enacted, etc., that no person authorized to practice physic or surgery shall be allowed in any civil case to disclose any information which he acquired in attending a patient in a professional capacity, and which was necessary to enable him to act in that capacity, which shall tend to blacken the character of his patient, without his consent."

Such laws as these, it must be noted, seek to prevent a physician or surgeon from voluntarily revealing secrets and thereby committing not only a breach of honor, but also doing serious harm to members of the public who must enter into confidential relations with them. Where, on the other hand, professional communications are made in furtherance of a criminal purpose they are by no means privileged and may be used as testimony in the courts.

<sup>1</sup> See Privileged Communications, page 34.

Communications which have been denied privilege are, for example, a request by a woman to a physician to commit an abortion; communications from one physician to another made to secure the aid of the latter in the commission of an abortion; and where a physician is consulted by a seducer as to the means of producing an abortion.

In short, the rule of privilege does not apply to the relation of physician and patient where such relation exists for the purpose of committing criminal abortion. However, in the absence of any showing to the contrary, it must be presumed that communications between the two were for a lawful purpose and therefore privileged.

Aside from the absolutely legal requirements of the case, the physician has a distinct duty to his patient and to the public. He must not violate his patient's confidence, and his effort should be not only to save her life and health, but, if possible, her character. Much can be done in this way by those who see many women as patients by setting forth clearly the moral and physical dangers of criminal abortion. Too much stress cannot be laid upon the fact that the crime is equally notorious whether performed in the first weeks of pregnancy or when the ovum has become a child. The absolute refusal of the physician to entertain such a proposition has its influence for good. A physician should be able to direct unfortunate women to those who can help them, and to warn and to protect them against the practice of abortion. It is a despicable act to take from these poor creatures their little savings under pretense of admitting them to some hospital for a fee; and yet we regret to say that on several occasions unmarried women have come to hospitals, having paid a fee to some physician under the belief that he had secured their admission. It is the duty of each physician to co-operate with reputable charitable institutions to secure care for these patients. Our large cities contain numerous private lying-in hospitals and midwives' houses whose sole purpose it is to deprive the patient of her money, and, if possible, her offspring of its life.

When, however, a physician is summoned to a case of criminal abortion, he has a duty to fulfil to the community as well as to the patient. Each coroner and city official may interpret his duty differently. In the main, however, it may be stated that without revealing the patient's name he may with propriety acquaint the proper authority with the existence of the case and ask their counsel. It is often the case that only the patient knows the name of the perpetrator, and it will usually be found that she will not reveal his identity. If she recovers, the secret remains hers, and the fact of the abortion is known to her physician. If she dies or is in danger of death, upon his information the authorities will intervene.

Reputable physicians may be made the subjects of blackmail and falsely accused of committing abortion. This but emphasizes the rule which careful physicians follow, namely, to make no examination of the pelvic and abdominal organs of unknown women without the presence of a third and known person.

A designing woman may induce a physician to commit abortion by



describing symptoms pointing to some disease of the womb which requires an instrumental examination. In former times, when the use of the uterine sound was common, a physician might introduce this instrument to measure the length of the womb and thus rupture the sac of the ovum, producing abortion. At present, among those best qualified, the uterine sound is rarely employed, and the interior of the uterus is never invaded without stringent necessity and every precaution. The possibility of pregnancy must never be lost sight of in conducting any pelvic or abdominal examination, and if this be kept in mind, accidental or unwitting abortion will rarely be produced by physicians.

# INFANTICIDE

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By infanticide is understood the unlawful destruction of the new-born child. The question at once arises as to whether the destruction of the child during the process of birth is infanticide. Is the product of conception at this time still a portion of the mother's body, or is it a separate individual? An illustration may be found in a case described by Blöttner.<sup>1</sup> A physician was called to attend a case of confinement, and found the fetus in transverse presentation. He failed to turn the child, and then endeavored to remove the child piecemeal. He was unsuccessful in this, and another physician terminated the labor. The mother died as the result of her injuries, and the first physician was subjected to arrest. In his defense it was urged that he had not been guilty of infanticide, but simply of careless and inefficient practice. As the child was not born, it was not a separate individual, but a part of the mother's body. For the prosecution, the attorney recognized the contention of the defense, but urged that as the child was partly delivered when the first physician was summoned, it could not be regarded as anything but a separate entity. The subsequent decision of the Court was in favor of the physician, and he was simply fined for negligent and unskilful practice.

The precise determination of what constitutes individual life has been a matter of repeated discussion by the courts of various countries. Ordloff<sup>2</sup> lays stress upon the fact that the fetus does not become an independent being until it has breathed the external air into its lungs. This is the opinion of most medicolegal authorities. It can readily be seen that important issues may turn upon this point. If the fetus be destroyed purposely before birth, it might be claimed that its destruction was accidentally due to unsuccessful efforts at delivery. If the fetus died in birth, the question as to whether it can inherit property may decide the disposition of an estate. The writer recalls the case of a mother dying from convulsions, upon whom, at the moment of death, the physician in attendance performed cesarean section. The child did not breathe, and hence by the terms of the will the mother's fortune was not inherited by the child nor its father, but passed directly to an institution. Had the child breathed in the presence of witnesses it would have inherited, and upon its death the property would have passed in whole or in part to its father.

<sup>1</sup> *Klinische medicinische Wochenschrift*, 1887, p. 81.

<sup>2</sup> *Vierteljahresschrift für gerichtliche Medicin*, 1889.

Strictly speaking, infanticide is the intentional destruction of the newborn child and the destruction of the fetus during birth. The latter is sometimes justifiable when labor must be quickly ended in the interests of the mother. The former can never be justifiable. An interesting question arises as to whether the destruction of a monster born living is justifiable. Cases are on record in which an attendant, afraid to allow the mother to see a monster, has killed it as soon as born. Although the circumstances must be regarded as extenuating, still the action cannot be lawful. The monster is in possession of life, and cannot rightfully be deprived of it. Fortunately, in a great majority of cases monsters are incapable of independent existence, and soon perish spontaneously.

A wide difference exists in the precise determination and definition of criminal abortion and infanticide and of the penalties which follow each. In an article on the law of infanticide, Glaister<sup>1</sup> reviews extensively the laws of the British Empire, and points out some discrepancies in them and practical difficulties in their enforcement. As English common law is, to a considerable extent, the basis of the law of the United States, this paper may be consulted to advantage by those interested in the subject. Its conclusions do not bear directly upon our consideration of the subject.

Especial importance attaches to the diagnosis of criminal abortion and infanticide. In the nature of the case, many difficulties surround this diagnosis. First, the secrecy which the unfortunate patient strives to maintain, and the extraordinary fact that, however much she may suffer herself, she will rarely betray the person who destroyed the product of conception. In the physical nature of the case many difficulties arise. Illegitimate births often occur without medical attendance. The mother may be alone, and, struggling in the pains of labor, may fall unconscious at the moment of birth. The child's face may lay in the blood and discharges from the womb, and respiration be prevented or much impeded. If the mother be standing at the moment of birth, the child breaking its cord may fall upon the floor and sustain serious injury. During a protracted labor, while within the body of the mother, the child may sustain injuries through pressure which may cause it to perish soon after birth. Drunken mothers sometimes smother their children while in bed with them, without deliberately intending to destroy their lives. These difficulties in diagnosis can best be appreciated by the narration of typical cases which illustrate the points under consideration. Birge<sup>2</sup> reports the case of a young woman who gave birth at eight months to an illegitimate child, labor being brought on by a criminal abortion. The mother was alone when the child was born, and, being unable to help herself or the child, made no effort to do so, and the child perished. She attempted to conceal its body, but failed. When the case was investigated, the principal and accessory to the abortion were secured; it was held in the case of

<sup>1</sup> Edinburgh Medical Journal, 1895-96, No. 41, p. 1.

<sup>2</sup> Atlantic Medical Weekly, 1896, v, 161.



the mother that as she had given evidence for the prosecution and had been guilty of omission only she could not be charged with infanticide. Here the difficulty in deciding whether the child had purposely been allowed to smother or not is evident.

It occasionally happens, with patients in institutions surrounded by attendants, that an illegitimate child may die under suspicious circumstances. The following case is an illustration: The mother of the child was a young, immoral woman, confined in a hospital. When convalescent, she was allowed in the nursery where the infants were kept, and when directed to do so by the nurses, to give her child the breast. Her milk, however, failed, and the child was fed artificially, the food being prepared under careful supervision, but not by the mother. The child was taking no medicine, was gaining in weight and doing well. Although the mother was not nursing the child, she was allowed to assist in bathing and caring for it. During the night previous to its death the night-nurses reported the child well. It slept in a crib in the nursery, the mother occupying a bed in the ward. At 7 o'clock in the morning it was seen by the head nurse and was then doing well. It had been fed at six in the morning, its usual food, and had taken it eagerly. After the head nurse saw the child at 7 A. M., the mother was allowed to sit with the child for an hour. At 8 A. M. one of the nurses discovered that the child was ill. Its symptoms were dilatation of the pupils, redness of the eyes, frothing at the mouth, light, pea-green discharges from the intestines with mucus, and a greenish, watery vomit containing mucus. Its stools were alkaline in reaction, the abdomen was distended with gas, and the child, in spite of prompt treatment, died six hours after it was discovered to be ill. The mother strenuously objected to an autopsy, and in the absence of any positive proof, none was obtained. It is quite true that acute gastro-enteritis in a young infant may result fatally in a short time, but the occurrence was somewhat remarkable, and the precise nature of the child's illness was not satisfactorily determined. Acute gastro-enteritis was evidently present, but whether the mother could have given the child an irritant substance dissolved in water during the hour in which she sat with it is very hard to determine. Irritant substances and drugs are kept strenuously under the care of the nurses in the hospital.

In sharp contrast to cases where diagnosis is so doubtful are those where the evidence of intentional infanticide is overwhelming. Zoggl<sup>1</sup> reports the case of a woman, illegitimately pregnant, who denied her condition until the very last, suppressed her sufferings in labor, and allowed the child to be born in an out-house. It fell into the pit of the out-house, but as the time was winter and the contents of the pit were frozen, the mother feared lest the child might survive. She accordingly removed it and strangled it with her fingers, the marks of her nails being plainly evident on the child's neck.

The difficulty in diagnosing between precipitate birth and

<sup>1</sup> Fried. Bl. für gerichtliche Medicin, 1888.

infanticide has already been alluded to. Teufel<sup>1</sup> describes the case of an unmarried woman who was taken with cramps while upon the street, and who was delivered in the standing posture, the child falling to the floor and giving a cry. The mother was near a large stone at the time, and hastily seizing the child, in picking it up struck it against the stone. The child's body was subsequently buried, but afterward found. Here infanticide could not be proved. Klein collected statistics of 183 precipitate births, in 155 of which the patient was standing at the moment of delivery; in 22 she was sitting; and in 6, kneeling. From the study of these cases he concluded that fatal injury is comparatively rare. He doubts the possibility of birth occurring while the patient stands upright. Kluseman<sup>2</sup> describes cases of precipitate births, among them one in which a married woman chose the upright posture during labor. Another case is described of a married woman who had several times assumed this posture, a midwife kneeling beside her to prevent injury to the child. Casper describes a case in which a patient was suddenly confined while standing, the child falling upon the snow and receiving fatal injury. He saw a patient about to enter a hospital suddenly give birth upon the threshold, the child falling to the granite floor and receiving fatal injury. Hoffmann describes similar cases, in one of which the child was suddenly expelled while the patient was being lifted from a wagon and carried into the hospital. Olshausen<sup>3</sup> reports similar cases. Reinhard, in a dissertation published in 1871 at Marburg, collected 23 cases. Pullman describes the case of a mother overtaken by labor while in a bath, the child being born upon the floor before she could reach her bed. These cases occurred in married women who had no reason for concealment.

There is abundant evidence to show that a woman may unexpectedly and suddenly give birth while in the upright position before she has time to assume another. In these cases the cord is either torn across, or the placenta is expelled with the child. The child strikes the floor with its presenting part. Its injuries depend upon the length and nature of the cord, the distance through which it falls, and the hardness of the floor. Plannkuch<sup>4</sup> and Hoffmann<sup>5</sup> found that a weight of 1000 gm. or less is sufficient to tear the cord. The longer and thinner the cord is, the more easily is it torn. It is never torn clean across, but in parts the amniotic covering tearing first. It is possible in the case of a torn cord for the child to bleed to death, but it is not common, because the muscular wall of the umbilical arteries usually contracts and stops the bleeding. Casper holds that the child will not die if it be still attached to the placenta and that be partly separated. The cord must be severed between the umbilicus and the placenta before bleeding will occur.

From the study of 100 cases of precipitate birth Hoffmann con-

<sup>1</sup> Vierteljahresschrift für gerichtliche Medicin, 1896.

<sup>2</sup> Ibid., 1897, Bd. xii, H. 2; Bd. xx, H. 2.

<sup>3</sup> Monatsschrift für Geburtskunde, 1860, 4633.

<sup>4</sup> Archiv für Gynäkologie, 1875, H. 7, S. 28.

<sup>5</sup> Lehrbuch, S. 751.

cludes that the fetal cranium is always injured by these occurrences. Fractures and fissures of the cranial bones are the most common injuries, usually on the side of the head, very rarely on its posterior surface. The fracture or fissure is usually a radiating one. To establish the facts, however, that the injuries have resulted from sudden birth, the mother must be examined and also the child, to ascertain whether this has been possible. Women having large pelves, strong uteri, and widely dilated birth-canals are those patients most apt to have this experience. The smaller the child, the greater the liability also. The examination of the child should include not only its head but also the lungs, as evidence of respiration has been found after very extensive crushing injuries to the head. Adloff<sup>1</sup> describes the case of a woman who asked to be taken upon a wagon filled with sacks of potatoes and going toward her home. After she had left the wagon the driver noticed blood-stains upon some of the sacks. He reported the case, and a midwife was sent to the patient, who had discovered that she had been delivered of a child. The cord was torn off. She wrapped the child in her skirts and carried it home. She placed it beside her, and it was living. She then lost consciousness, and when she regained it the child was dead. The body of the child was examined some time after its death, and when highly decomposed. Evidences of respiration were found, and the bones of the skull showed that the child had been destroyed by blows upon the head.

## CEREBRAL HEMORRHAGE IN THE NEWBORN

Warwick<sup>2</sup> examined the bodies of 36 newborn infants, finding hemorrhage in some part of the brain in 18, or 50 per cent. Eleven of the 18 mothers were primiparæ and many of them above the average age. But one of these children was delivered by forceps, prolonged labor was present in 2 cases only, and 2 only of the 18 children were still-born; 4 had asphyxia and 2 showed respiratory symptoms on birth, 44 per cent. or 8 of these infants had hemorrhage in other organs of the body than the brain, 5 vomited blood before death, one-fourth of them were premature, but none showed signs of syphilis. In 72 per cent. of the cases the hemorrhage was over the cerebrum where the vessels branch from the longitudinal sinus. At birth these vessels are not protected by the dura mater.

Cerebral hemorrhage in the newborn may arise from traumatic injury to blood-vessels during the stage of molding of the head, the labor itself may be normal. It may also be caused by congestion of the blood in the brain producing rupture of the veins, and this he believes happens in prolonged and complicated confinements. Cerebral hemorrhage in infants may also be caused by intra-uterine disease or toxemia on the part of the mother. Very frequently no one cause is entirely responsible and the condition is the result of several factors.

<sup>1</sup> Vierteljahresschrift für gerichtliche Medicin, 1891.

<sup>2</sup> American Journal Medical Sciences, July, 1919.



## SPONTANEOUS RUPTURE OF THE SPLEEN IN THE NEWBORN

Heinrichsdorff<sup>1</sup> describes the case of an infant dying two days after birth. The labor was spontaneous, not difficult, and there was nothing which seemed to endanger the child. No efforts were made to resuscitate the child. The child had no disease which might have caused enlargement of the spleen before birth. Congenital syphilis was possibly present. At autopsy there was hemorrhage in the abdomen, and on the anterior border of the spleen there was a tear 4 cm. long, in the capsule there was another tear 4.5 cm. long on the posterior border of the spleen. The only clue to the condition was progressive weakness of the child, with some rise of temperature. Should such a state be suspected immediate operation is the only chance.

It is sometimes impossible to prove definitely that death in a given case was the result of direct interference. Wolf<sup>2</sup> reports a case in which a dead child tightly wrapped in straw was found beside a stone wall. It was traced to a servant woman, who said that the child was hers, was still-born, and that she had placed it on the top of the wall. At autopsy there was no evidence of violence, no foreign body in the air-passages, and no assignable cause for death. It was impossible to prove that the woman had destroyed the life of the infant. A case similar to the preceding is described by Kob,<sup>3</sup> in which the body of a child wrapped in linen cloths was found in a muff-box. No signs of violence could be detected. The mother of the child was a dissolute young woman, living with her mother, a person of bad reputation. No reasonable doubt existed that the life of the child had been purposely terminated, as it was found to have breathed. The exact method employed could not be determined, but the older woman was convicted of the crime, while the younger was acquitted as being merely guilty of negligence. Undoubtedly the previous bad character of both women strengthened the suspicion against them.

An effort is sometimes made by a mother illegitimately pregnant to destroy the child by injuring its air-passages. Schiller<sup>4</sup> describes the case of a woman who gave birth to an illegitimate child, and who was found by another woman with the child screaming beside her. When aid was summoned, it was found that the child was dead. The mother asserted that she had become unconscious after the birth of the child, and that she had not intentionally injured it. Autopsy disclosed that the child had died from suffocation caused by hemorrhage into the bronchi. A blunt instrument or the fingers had been thrust into the child's throat. The guilt of the mother was proved in this way.

It is a matter of great difficulty to diagnosticate clearly the presence of injury to the fetus received during parturition. Such may be of two kinds—that by direct mechanical violence, and injuries brought about by the administration to the mother of poisons or of drugs acting

<sup>1</sup> Monatschrift für Geburtshilfe, Band 40, Heft 2, 1914.

<sup>2</sup> Vierteljahresschrift für gerichtliche Medicin, 1889.

<sup>3</sup> Ibid., 1895, 9, 10.

<sup>4</sup> Ibid., 1887.

upon the fetus. The former—namely, destruction of the fetus by mechanical means—is exceedingly rare; the latter has been observed, although not commonly. Laying aside embryotomy as a completed operation, Dölger and Maschka<sup>1</sup> very rarely found cases of direct mechanical interference with the child before birth, with the exception of the operation of embryotomy. Casper, from the examination of many cases in which the fetus was found in out-houses, could not in a single case assert that there was bodily evidence of the use of mechanical agents before birth. Hoffmann thinks it possible to injure the head when the membranes are ruptured. The writer recalls a case in which a physician pierced the scalp of the fetus, supposing that he was rupturing the fetal membranes. The injury was slight, however, and when seen in consultation the child was doing well and probably recovered. Tardieu could collect but 5 cases. Lafargue saw 1 case; Gallard 1. Liman reports a case in which a cut was found over the crest of the fetal ilium. Olliver and Boyer saw wounds upon the fetal vertex.

### INFANTICIDE DURING BIRTH

Bogdan<sup>2</sup> describes the case of a woman who endeavored to kill her child so soon as the head appeared in the vulva, she grasped the neck with both hands, but became faint and could not accomplish her purpose. She then struck the head of the infant violently with some hooked implement, and succeeded in tearing apart the umbilical cord. On the neck of the child there were found abundant marks of the fingers and nails, scratches and wounds of epidermis, extravasations of blood in the connective tissue and in the muscles of the neck. There were clots of blood in the mouth, larynx, bronchi, and bronchial tubes. The lungs contained air and floated in water. There were numerous ecchymosis on the superficial portions of the lungs, also beneath the pericardium, and fracture of the right parietal bone, with hemorrhage and extravasation of blood under the periosteum. The immediate cause of death was fracture of the skull.

This case is remarkable for the fact that infanticide was accomplished during the actual birth of the infant.

It is well known that poisons taken by the mother can be communicated to the child. Mende draws attention to the use of opium to terminate fetal life, as practised in Japan. The proposition to destroy the ectopic fetus by injecting morphin into its sac is of a similar nature. Kubassow has collected instances where chloral hydrate, chloroform, opium, and digitalis were used. Walter and Gusserow experimented upon pregnant animals, not finding in the fetal blood strychnin, morphin, veratrin, curare, and secale cornutum, which had been administered to the mother. Gusserow, in repeating these experiments upon 12 pregnant women, found that potassium iodid was detected in the fetal body about two weeks after it had been given to the mother—that

<sup>1</sup> Fried. Blt. f. gerichtliche Medicin, 1892.

<sup>2</sup> Proceedings Society for Legal Medicine, 3d Series, Band 47, p. 120.

is, children born two weeks after the mother had taken the potassium iodid showed the presence of the drug in the fetal urine. Clouet examined the liver of a fetus born of a mother who ate matches, and found potassium in the liver substance. The iodid seemed to be the only drug readily passed from mother to child. The question arises, Does the successful treatment of syphilis in pregnancy point to the direct passage of mercury to the fetus, or is its effect upon the fetus explained by the improved condition of the mother only? The latter is the more probable supposition.

As an extenuating circumstance in infanticide and as complicating the diagnosis of this condition we must consider the mental and nervous condition of the mother. Krafft-Ebing<sup>1</sup> illustrates this in the description of the case of a woman whose dead child was found about ten days after birth. The cord was wrapped tightly about the fetal neck. The child was enveloped in a woollen jacket, and the body was found in a mill-pond. The patient stated that she had been deceived and deserted, and that the child was born while she was working in the garden. She tied the cord with her handkerchief, but did not remember that the cord was about the neck, nor did she remember to have placed it there. She had no intention of killing the child. After its death she wrapped it in the jacket and placed it in the mill-pond. Her employer and others stated that her mental condition had lately been much disordered. Her mother was a cataleptic. The patient had always suffered greatly at her menstrual periods, and had recently declared that she would commit suicide. Under the circumstances she was not convicted of wilful infanticide.

In determining the question of infanticide it must be remembered that a considerable quantity of mucus is often present in the child's throat at the time of delivery. Rancher reports<sup>2</sup> a case in which a still-born child was examined to determine infanticide. Death had undoubtedly resulted from suffocation. There was, however, a large amount of greenish mucus in the child's pharynx, and it was impossible to determine that the suffocation of the infant had been intentional. He also reports a case which illustrates the difficulty in proving the commission of infanticide. An infant was found immediately after birth by a midwife, and said by the mother to have been still-born. It was illegitimate. The only evidence of infanticide present was a bluish spot upon the child's throat. At autopsy not the slightest trace of violence could be detected, and the crime could not be proved.

Suffocation is usually effected by holding the hand over the child's mouth or by placing some soft material over the face. Fielitz<sup>3</sup> reports 3 cases of infanticide in which the perpetrators described the methods employed. In one instance the hand was held over the child's mouth; in another, a feather bed was placed over the infant; and in the third, the child's head was wrapped in an apron.

<sup>1</sup> Fried. Blt. für gerichtliche Medicin, 1889.

<sup>2</sup> Ibid., 1888.

<sup>3</sup> Vierteljahresschrift für gerichtliche Medicin, 1891.



A mother, in endeavoring to extract the child from her body, may cause injuries apparently intentional. Comrick<sup>1</sup> illustrates this point by the case of an unmarried servant woman, delivered alone of a child, which was found living under the steps of a closet. The child was covered with blood, its mouth wide open, its tongue directed toward the right side. It died a half hour after it was found. On examination the lower jaw was found broken in several places, and sufficient hemorrhage had ensued to cause death. The patient stated that in birth she had placed her thumb in the child's mouth so soon as the head was born, and pulled violently to hasten delivery. She was convicted of criminal carelessness, but there was no evidence of infanticide.

Carbolic acid is occasionally employed to destroy the infant. Coester<sup>2</sup> observed a case in which a mother admitted to have given her infant a teaspoonful of clear carbolic-acid solution, which had been prescribed for her to be diluted and used in vaginal douches. Cohn, in the same journal, describes a case in which a compress saturated with pure carbolic acid was placed over the child's umbilicus. Death resulted.

### INFANTICIDE BY THE USE OF A NEEDLE

Meixner<sup>3</sup> reports the case of an infant dying on the fourth day, and examined carefully at autopsy, whose body showed no lesions until the skull was carefully dissected. On removing the cranium a sewing-needle was found in the greater fontanel, the point of the needle lodged in the right upper hemisphere of the brain, there was a very minute discharge of blood. The inner aspect of the cranium showed only a very small blood-red spot. The mother, an unmarried woman, had inserted the needle to destroy the child; she had also given the child poison which produced its death, and the wound in the cranium was not the cause of the fatal issue.

### VIOLENT INFANTICIDE BY INTRODUCTION OF FOREIGN BODY INTO THE AIR-PASSAGES

Von Horoskiewicz<sup>4</sup> describes 4 cases where newborn children have been killed by the forcible introduction of foreign bodies into the air-passages. The lesions found in the bodies of these children were wounds of the gums and mucous membrane of the mouth, lacerations of the posterior surface of the tonsillar region, extravasation of blood into the mucous membrane of the mouth, lacerations in the membrane lining the cheeks, and in 1 case fracture of the ribs and wounds of the larynx and bronchi.

In one instance an iron hook had been pushed down the child's trachea without causing wounds of the mouth and jaws. In another, a corkscrew had been forced down the throat producing lacerations and extravasations of blood in the mouth and gums.

<sup>1</sup> Vierteljahresschrift für gerichtliche Medicin, 1896.

<sup>2</sup> Ibid.

<sup>3</sup> Encyclopedia of Legal Medicine, Band 48, Supplement No. 1.

<sup>4</sup> Proceedings German Society for Legal Medicine, Band 47, Supplement, p. 111.

## THE PATHOLOGIC APPEARANCE FOLLOWING ATTEMPTS AT INFANTICIDE

Ziehe<sup>1</sup> reports the case of a prematurely born infant on whom infanticide was attempted by the father. The autopsy showed that the trachea and bronchi had been injured by forcible pressure of the fingers on both sides of the neck. There was extravasation of blood in the posterior part of the tongue and epiglottis and in tissues about the larynx. The child lived forty hours after birth, so that the effort to destroy it must have been of short duration. Evidently the cutting off of the supply of oxygen did not last long enough to cause death. The fatal results followed severe bodily injury.

In the investigation of the case it was brought out that owing to the histologic and anatomic peculiarities of the newborn that mechanical injury to the tissues involved would produce its effect more tardily than in the case of adult individuals.

The result of infanticide is the destruction of the infant's life. It is impossible actually to estimate infant mortality from this cause. The reports in eleven urban districts in England from 1871-75 show a mortality among illegitimate children of 388 in a 1000, while among legitimate infants in the same districts the mortality was 192 in a 1000. Other statistics lead us to believe that the illegitimate infant is four times in danger of death to one chance which the legitimate child must meet. The maternal mortality of infanticide results but indirectly in these cases. Hemorrhage and septic infection are the principal causes, with an exceptional serious result from shock. The circumstances of illegitimate birth, with the profound nervous depression, loss of blood, and anemia, frequently leave these patients in bad general health.

The question naturally arises, What can be done to diminish the prevalence of this crime? It was allowed in some countries in ancient times. Children were sometimes offered as sacrifices to heathen deities. Children were offered on the altar of Moloch, and this was done by Solomon and others. In Carthage the people wished to sacrifice Hannibal's child to their gods. The Romans checked infanticide for religious rites, but allowed it for other reasons. Parents desiring to rid themselves of their children sent them to a place appointed, where any one could go and secure a child if desired. Those that were not taken were killed. Tacitus declares that the Germans did not practise this crime, and under the Roman Republic it became less common. In the time of Trajan the state adopted and supported children which otherwise would have been killed. In the third and fourth centuries A. D. infanticide became again common in the Roman Empire. The Bishop of Rome and Constantine made infanticide punishable by death. Poor parents were assisted by the state in maintaining their offspring. Parents could dispose of their children if they so desired. These laws, however, were very difficult to enforce. During the middle ages infanticide was punished as a religious offense. Newborn children with-

<sup>1</sup> Proceedings Medical Legal Society, 3d Series, vol. 47, p. 20.

out homes were laid upon the doorsteps of monasteries and clergymen's houses. As all charity was dispensed by the clergy, this was an appeal for help for the child. In 1530, in the reign of Karl V., a person convicted of infanticide was sentenced to be drowned. This was the common penalty throughout Europe. Toward the close of the eighteenth century milder punishments were decreed throughout Germany, and efforts were made through Europe to lessen the crime by helping the poor and by establishing foundling asylums. In the Prussian estates foundling establishments are not allowed because of their great expense and high mortality. Mother and child are cared for together, and the father of the child is obliged to contribute to its support. Baby-farming or the boarding-out of infants is attended with a mortality estimated at over 30 per cent.

At the present time modern philanthropy endeavors to prevent infanticide in two ways: The unfortunate mother so soon as her pregnancy is discovered is aided to obtain suitable work, medical attendance, and, if necessary, financial aid. She is warned against criminal abortion, and is kept under observation by the agent of a charitable society. Her confinement takes place in a maternity hospital, and every effort is made to encourage her love for the child. If the father of the child is a suitable person, the endeavor is made to bring about a marriage. Should this fail, legal proceedings may be instituted to compel him to aid in the support. When the mother is convalescent she is assisted to get work in the country, taking her child with her, and is kept under observation by a proper visitor. When the child grows older it is placed in a free school. Others maintain that a foundling asylum gives the best chance for the mother and a fair chance for the child. By those who favor this plan the child is taken from the mother soon after birth, is placed in a foundling asylum, artificially fed, and should it survive is adopted or placed in a public school. The mother returns to her work and has but little, if any, knowledge regarding the child. The father may be obliged to pay something to the mother, but he does not follow the fate of the infant. This course is open to the very grave objection of great infant mortality. Many think that the influence upon the mother of caring for her child through the first weeks of its life should not be neglected. The former seems the better plan, and is successfully carried out in many of our large cities.

Recent studies in the pathology of the fetus are of importance as bearing upon the diagnosis of the respiratory act. It has been commonly supposed that solidification of the fetal lung and the persistence of this condition after birth indicated that respiration had never been performed. Cases are on record, however, where a child has breathed after birth, where, because of injuries during birth, it has suffered from pulmonary hemorrhage and has perished without intentional violence. It must be remembered that interference with the fetal circulation during labor produces respiratory movements and considerable alterations in the blood tension of the fetus. Attention must also be called to the fact that, in attempting to resuscitate an asphyxiated child by some of



the methods commonly employed, air may be forced into the lungs of an infant that never breathed spontaneously. From an examination of the infant's body alone it may be impossible to assert that a respiratory act did or did not take place. The importance of this fact upon expert testimony based upon an autopsy only must be apparent. The simple hydrostatic test of the infant's lung is in no way sufficient to establish the presence or absence of respiration, and hence a verdict of infanticide based largely upon this might be exceedingly wide of the mark.

## THE VALUE OF THE TEST OF FLOATING THE LUNGS IN WATER AS PROOF OF RESPIRATION

Schönberg<sup>1</sup> describes the case of a pregnant woman dying of tuberculosis, not in labor and membranes unruptured, from whose body at the moment of death was removed an infant 32 cm. long. When placed in water the lungs floated. There had been no interference with the fetus during pregnancy, and the fetal body showed no signs of decomposition. Microscopic examination of the lungs showed that gas was present in the lungs.

In discussion Streckeisen explained the microscopic findings by the comparatively long death process of the mother, which resulted in the passage of carbonic-acid gas into the body of the child.

Schüler,<sup>2</sup> in the case of a mother dying of puerperal infection, with the *Bacillus aërogenes capsulatus* tested the lungs of the fetus and found that the lungs floated in water.

## MICROSCOPIC EXAMINATION OF THE LUNGS OF THE NEWBORN

Nippe<sup>3</sup> calls attention to the fact that a high degree of decomposition does not prevent a diagnosis by microscopic examination of the lungs, that a newborn child has breathed. This results from the fact that the epithelia of the bronchi are altered by respiration, and that this is shown by microscopic examination.

In macerated children the trachea is not open at birth, but the collapsed walls of the trachea form a concave pocket directed posteriorly. He narrates an extraordinary case of a body of a newborn child where an effort had been made to burn it. The lungs were shrunk and partly consumed, but microscopic examination showed that air had penetrated into the small air-passages and that the child had breathed after its birth.

As an illustration of the fact that the lungs of the child may be found practically solidified after respiration we insert the postmortem findings upon the case of an ill-nourished infant, born spontaneously, and seen to breathe repeatedly during the seven and a half hours of its life. The case occurred in the maternity ward of the Jefferson Medical

<sup>1</sup> Berlin klin. Wochenschr., Band 52, pp. 542, 590.

<sup>2</sup> Münch. med. Wochenschr., Band 61, p. 48.

<sup>3</sup> Proceedings German Society for Legal Medicine, Band 47, Supplement, p. 64.

College Hospital, under the observation of the House Staff, and the autopsy was made by the Pathologic Staff of the hospital. Had it been necessary, abundant witnesses could have been procured to prove the occurrence of respiration. The autopsy notes are as follows:

A white male child, aged seven and a half hours. The subject shows post-mortem lividity on the face and upper and anterior portions of the body. Post-mortem rigidity scarcely perceptible.

Brain and its meninges are normal. On section, the abdominal organs were found in their normal positions. The cavity contained a normal amount of clear yellow fluid. All the abdominal organs were normal. However, a Meckel's diverticulum about 1.5 cm. long was found 25 cm. above the ileocecal valve. The pleural and pericardial cavities were normal in every particular. With the exception of the heart muscle being somewhat flabby, the organ was normal. Both lungs were in a state of complete solidification. They did not crepitate, and sank when placed in water. While not exactly resembling it, the appearance was more that of the stage of red hepatization of pneumonia than of any other condition. Cultures were made from the lung and heart on blood-serum tubes, but bacteria did not develop.

*Microscopic Examination of the Lungs.*—Pieces of the lungs were fixed in Heidenhain's mercuric chlorid solution and embedded in paraffin. Sections were stained in hematoxylin and with eosin and acid orcein, and by the methods of Van Gieson and Weigert.

On examination, the pleural covering of the lung is found uniformly considerably thickened, as are also the trabeculae sent into the lung substance from the pleura. This thickening is due to interstitial hemorrhage; the blood, which contains no more than the normal number of leukocytes, seems to have penetrated between every fiber of the elastic and collagenous tissues which make up these structures, and, in most cases displacing the epithelial cells on the outer surface of the pleura, has gained the free surface of the membrane. The walls of the blood-vessels of the trabeculae have been included in this hemorrhagic process; the inner coats of these vessels, however, do not seem to have suffered as much as the surrounding tissues. The elastic and collagenous fibers stain faintly; it seems probable that this is the result of hemorrhage. The connective-tissue cells exhibit no change.

In every particular the alveolar walls present the changes which have been noted as occurring in the pleura and trabeculae. The tissues are so crowded with blood that it is impossible to make out the capillary walls, but nevertheless it cannot be doubted that the abundant and uniform hemorrhage must have been caused by rupture of these vessels. The epithelial lining of the air-sacs is entirely shed off. The lumina of the air-vesicles is considerably decreased by the swelling of their walls. For the reason that the size of a section of an air-vesicle will depend upon the point where it is cut, it is impossible to say with certainty just how much smaller they are in this instance. The lumina of the vesicles vary from 40 to 130 mm., with a general average of about 80 mm. in diameter. Sections from the lung of another infant show the average size of the vesicles to be about 110 mm.; the smallest of these are 70 mm. in diameter. The air-sacs are partially empty, but practically all contain numerous red and white cells, and here and there swollen epithelial cells. The last vary in size from 10 to 24 mm., and are rounded or oval in form. One or more vesicular nuclei are generally present, but some of the cells contain none; the protoplasm of these cells is intensely acidophilic. In many cases it seems to have taken the place of the epithelial cells on the walls of the air-vesicles, and is possibly the degenerate remains of these cells. If this is the case, the epithelial cells must have been in a great degree broken down before the birth of the infant. No fibrin was found in any of the sections. The epithelial cells lining the bronchi are in almost all cases detached from their basement membranes, but they appear otherwise normal. The smaller bronchi are usually filled with blood. No bacteria were present.

The clinical history of the mother and of the labor is as follows:

The mother of the infant was a primipara, aged nineteen. She was unmarried, was in an institution for the care of unfortunate women, and was taken in labor

without the knowledge of the matron. When her condition was discovered labor was well advanced. She was brought by ambulance to the Maternity Department of the Hospital, where it was found that the child's head was on the pelvic floor. In a few moments the child was easily expelled. It was a male weighing 4 pounds,  $\frac{3}{4}$  ounce, showed no apparent abnormalities, and was 43 cm. long. The placenta was normal. Seven and a half hours after birth the child died without apparent cause. It had breathed and cried and seemed to be doing well.

This case illustrates the fallacy of basing positive evidence upon the condition of the fetal lung. Had this child not been born under careful observation, but had its body been found and an autopsy made, it might have been asserted that the child had never breathed. Its lungs sank in water, and not the slightest evidence of respiration was present. If the cause for this condition be sought, it must be ascribed to the congenital fragility of the capillaries in a premature child, born from a weak and ill-developed mother.

By reference to the physiology of respiration and from a study of the variations in intrathoracic pressure which the respiratory movement brings about, we find that the conditions are favorable for rupture of the capillaries of the lung. During forcible inspiration the air-passages are fully open, the lungs are greatly distended, and diastolic distention of the heart is present. There is also dilatation of the intrathoracic and intrapulmonary blood-vessels. The veins are more affected than the arteries. The heart-beat becomes small because the negative pressure in the thorax acts upon the thin walls of the auricles and impedes their contraction, so that but little blood flows into the ventricles. The conditions are such as to favor the accumulation of blood in the vena cava and pulmonary veins. Efforts at respiration during labor arise most frequently from interference with the circulation of the umbilical cord through pressure, or from direct pressure upon the body of the fetus. So soon as the fetus attempts to breathe in utero the amniotic fluid is drawn into the nasal cavity, where it acts as a powerful excitant to the sensory fibers of the nasal mucous membrane and calls into action the inhibitory respiratory impulses. When we recall the pressure to which the child is often subjected in difficult birth, it can readily be seen that a child may be born in difficult spontaneous labor, breathe repeatedly, and then die, its lungs presenting a condition of apparent solidification which might lead to the belief that respiration had never occurred. The following cases illustrate the points just made:

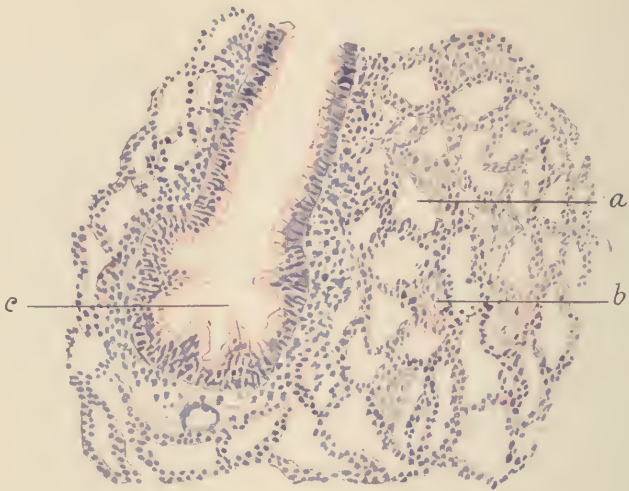
CASE I.—A seven months' fetus. Mother admitted to the Maternity Department of the Jefferson Medical College Hospital in labor, the fetus dead. Transverse position, shoulder presentation, the child impacted in the pelvis in the form of a wedge. The arm was amputated at the shoulder, the wedge decomposed, and the fetus delivered. Autopsy by Dr. David Bevan showed both lungs deeply congested. No apparent hemorrhages. Blood flowed freely from the open pulmonary vessels. The walls of the ventricles were relaxed, the ventricles filled with blood, the coronary arteries turgid. Microscopic sections of the lungs showed hemorrhage extending from the pleura into the lung tissue. In this instance the child had undoubtedly made respiratory movements during the long and fruitless labor of the mother before admission.

CASE II.—A female child, born at full term, asphyxiated, gasped feebly, breathed a few moments, and died. Its lungs were deeply congested, hemorrhages in the lungs similar to those in Case I. Its heart walls were relaxed, the cavities

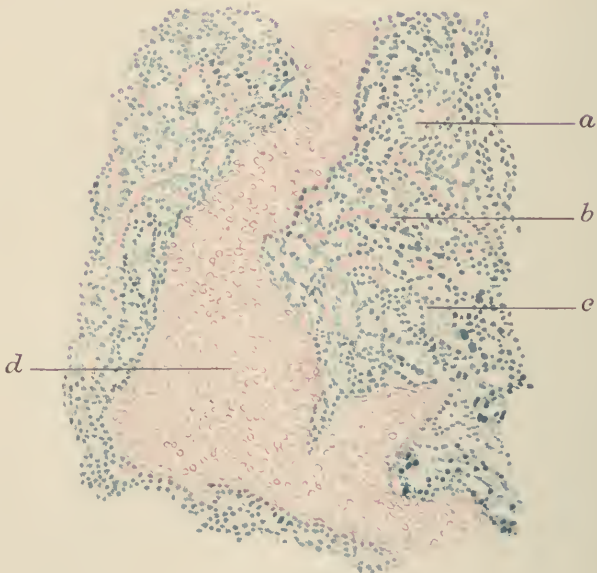




PLATE 3.



*Fig. 1.*



*Fig. 2.*

FIG. 1.—Human fetal lung, normal (Eye-piece 3; obj. Beck  $\frac{1}{4}$ ): *a*, Alveoli; *b*, inter-alveolar connective tissue; *c*, terminal bronchus.

FIG. 2.—Human fetal lung, showing effect of violent attempts at inspiration after rupture of the membranes, and complete stoppage of the circulation through the cord (Eye-piece 3; obj. Beck,  $\frac{1}{4}$ ): *a*, Alveoli; *b*, intra-alveolar connective tissue; *c*, dilated capillaries; *d*, area of hemorrhage.

filled with blood, and the coronary arteries distended. Its lungs sank immediately in water. Respiration, however, had actually occurred.

CASE III.—A full-term female child, delivered with great difficulty by the forceps. The head was severely bruised, and although respiratory movements were made, the child could not be permanently resuscitated. Artificial respiration was practised in this case. The left lung was completely collapsed. In the right the anterior free extremity of the middle lobe was partially inflated. Hemorrhages had occurred throughout the other portions of the lung.

CASE IV.—An infant dying shortly after a tedious spontaneous birth. Both lungs in a state of complete atelectasis. Numerous small hemorrhages beneath the pleura. Intense congestion. The abdomen contained a large quantity of blood-stained serous fluid. There were small hemorrhages beneath the two layers of the pleura. The heart walls were relaxed. All the cavities contained blood. The coronary arteries were turgid.

The difference between the normal fetal lung and that in which hemorrhage has occurred is shown on Plate 3, the drawings for which were prepared by Dr. Bevan.

Spencer<sup>1</sup> has drawn attention to hemorrhages in the newborn accompanying pressure in birth, and describes hemorrhage beneath the pleura and into the lung substance, which he styles "pulmonary apoplexy." Such infants die very shortly after birth, and upon examination the lungs are not inflated.

It seems to the writer from this consideration that because portions of the fetal lung sink in water and are found to be practically solid, the inference cannot be drawn that the child has not performed the act of inspiration and expiration. Whether this respiratory movement occurred within the uterus during labor or just after the birth of the fetus cannot be told in a case where no one witnessed the birth. It is possible for a woman to be confined alone, or for her child to attempt to breathe for several minutes, and then perish without interference on the part of the mother. The lungs of such a child would show no signs of inflation, but multiple hemorrhage, as described, would be present.

On the other hand, the child may be still-born, and artificial respiration may partially distend its lungs with air. The method known as Schultze's, which consists in grasping the child's body, holding the head between the wrists of the operator, raising the body over the operator's head, allowing the trunk to flex, then bringing the body downward toward the floor, causes air to enter the respiratory tract. Other methods less vigorous are often effective. It might easily happen that a child, still-born, subjected to vigorous efforts to introduce air into the chest, might show a considerable inflation of the lungs, although it had never breathed.

From these considerations we may well ask the question, Upon what can a diagnosis of infanticide be made? We must reply that a very careful study of all the circumstances of the case is necessary to form a correct judgment. It must not be forgotten that while the illegitimate child is most often destroyed, cases are on record where the legitimate infant has been sacrificed. As many illegitimate births occur while the mother is alone, the effort should be made so far as possible to

<sup>1</sup> Transactions of the Obstetrical Society of London, vol. xxxiii.



ascertain the history of the labor. A point of considerable importance is the period of time elapsing between the rupture of the membranes and the birth of the infant. The discharge of the amniotic liquid exposes the child to more direct pressure, and hence would facilitate respiratory efforts on the part of the fetus and the injuries incident to birth pressure. If it could be learned that the mother noticed a gush of liquid a long time before the actual expulsion of the child, we should thus ascertain that the conditions had been favorable for birth pressure.

The relative size of the mother and the child is a factor of great importance. If the entire body of the child be found, it can be weighed and measured. The mother's pelvis can be measured, and if it is found that a considerable disproportion exists, that the labor was long and tedious, the membranes rupturing early, birth pressure, as a factor in fetal injury, becomes a very important consideration. The body of such an infant might show hemorrhage upon the surface of the brain, which could lead an inexperienced observer to assert that a blow on the head had destroyed the child.

The respiratory tract and mouth of the child should be subjected to careful examination. It must be remembered that when a child does not breathe the finger of the person present may be inserted into the mouth to remove the obstruction to respiration. If, however, a foreign body be found packed into the mouth, such as cloth, paper, or cotton, if finger-marks upon the throat are observed, and dissection reveals the effects of severe pressure beneath, it must be inferred that direct efforts at strangulation had been made. The meningeal hemorrhages following severe labor differ from those resulting from blows upon the head in the fact that in the former the scalp is less severely injured than in the latter; but it must not be forgotten that the child may be expelled spontaneously, fall head foremost upon the floor or ground, and be fatally injured without interference on the part of the mother.

Should it be found that the umbilical cord had been severed cleanly with a sharp instrument and had not been tied or crushed, the inference must be that an attempt had been made at infanticide through hemorrhage. On the other hand, if the cord were found to have been torn or crushed apart, infanticide could not be proved, because in spontaneous birth the cord may tear asunder and the fetus survive, and because the cord may be severed with a blunt instrument or crushed asunder without causing the death of the fetus.

If the fetus were found with its mouth and bronchi filled with blood, amniotic liquid, vaginal mucus, and fecal matter the inference must be that it has lain face downward in discharges occurring from the mother's body at labor. It could not be shown if the mother were alone that this had been intentional, and the only inference must be that she omitted to take up the child upon birth, or that she was in a physical condition in which she was unable to do so.

Infanticide by exposing the fetus to cold is exceedingly difficult to prove. Cases are on record where a fetus supposed still-born has been

placed in a cold room, while nurses and doctors devoted their attention to the mother severely ill. To the surprise of all, the fetus has been found living after a considerable exposure of this sort.

### THYMUS DEATH

In all cases of sudden death in infancy the part played by the thymus gland in infant economy must not be forgotten. A newborn child dying suddenly with a neck larger than the average might be suspected of having been purposely destroyed by some pressure upon the neck. A thorough examination by autopsy should be made. When thymus death has occurred, the gland is found much larger than normal and making such pressure upon the pneumogastric and sympathetic nerves as readily to cause the cessation of vital function.

To those unfamiliar with the subject, thymus death is so extraordinary as to seem inexplicable, and injustice might be done if its true cause were not ascertained.

### THE MICROSCOPIC EXAMINATION OF THE THYMUS GLAND IN CASE OF SO-CALLED THYMUS DEATH

Hammar<sup>1</sup> describes the histologic examination of the thymus in 14 infants dying a so-called thymus death. In these cases he found the capsule and upper portion of the gland very much thickened, while the parenchyma was reduced to 1 mg. in weight.

The characteristic corpuscles seen in healthy thymus were lacking and the gland was infiltrated with leukocytes. From these examinations it was evident that the function of the thymus must have been greatly disturbed and in abeyance.

### RESUSCITATION OF THE NEWBORN INFANT BY MASSAGE OF THE HEART

Fisher<sup>2</sup> describes the case of an infant born by forceps after a long and difficult labor in which chloroform was given to the mother. The child was in pallid asphyxia and artificial respiration did no good. By pressing the fingers of the right hand deeply under the ribs and placing the fingers of the left hand on the chest at the left nipple the physician was able to grasp the heart; by massage in this manner the heart was made to beat and artificial respiration resuscitated the child, which made a good recovery.

There were marks of finger pressure on the chest for some time.

Efforts at concealing the body of the fetus do not give positive proof of infanticide, as illustrated in the following case: The Obstetric Resident of the Jefferson Medical College Hospital was summoned to remove by ambulance to the Maternity Department a servant woman, illegitimately pregnant, and confined alone in her room at the house of her mistress. The mother was wrapped up and taken to the hospital

<sup>1</sup> Zeitschrift für Kinderheilkunde, Band 13, heft. 3, 4.

<sup>2</sup> Journal American Medical Association, October 6, 1917.

as soon as possible, as the placenta had not been delivered. She asked to have taken with her her clothing contained in a small valise. Some hours after her admission the valise was opened to obtain fresh clothing for her, when the dead body of her child was found in the valise. Examination of the body of the child gave no evidence as to the cause of its death, nor could the mother be proved guilty of infanticide.

In concluding this section we must urge that each case be investigated thoroughly before a decision be based upon a single condition in the body of the fetus. The character of the mother, the circumstances under which she was confined, the presence or absence of an accomplice, the efforts to conceal the body of the child, or her readiness in acknowledging its birth, must all be considered. Her own physical condition, as well as the postmortem examination of the infant, should be taken into careful consideration.



# IMPOTENCE AND STERILITY

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THE medicolegal relations of impotence and sterility are, in the largest measure, dependent upon the bearing of those conditions upon the validity of the marriage contract; but in some cases of alleged rape proof of impotence in the male may assume great legal importance, and we can also conceive cases of alleged sexual crime in which proof of sterility in the accused would be a demonstration of his innocence. Again, impotence or sterility in the male might be sufficient to prove absence of marital paternity. The importance of such possibilities in their relations to marriage and the family calls for examination of the various conditions that constitute or occasion lack of sexual power or absence of ability to fecundate on the part of the male, and of those conditions affecting the female which render fecundation impossible.

**Sexual impotence** means merely lack of power to perform normally the act of sexual conjugation; it may affect the female as well as the male.

**Sterility** is a term denoting, in general, failure to procreate under circumstances that ordinarily are attended by procreation. It is etymologically applicable only to the female, but it has come to be used to include conditions affecting the male in which the fecundative male elements are incapable of performing their functions. Thus, the application of sterility is restricted to cases in which failure to procreate or to conceive is due to causes independent of the act of sexual conjugation itself. Hence, sterility does not imply impotence, nor impotence sterility, though both conditions may be combined in an individual.

## IMPOTENCE

The act of coitus is one in which many factors—physical, physiologic, and psychologic—enter, and these again differ as they are considered in the male or female; but since the male is the active agent in the act, his part is much the more important, and the one more open to functional derangement.

**Impotence in the Male.**—The part of the male in coitus consists of immission of the penis and emission of semen. The conditions that may interfere with the normal performance of coitus by the male, causing impotence in its narrow sense, may be divided into physical and psychic, *e. g.*, the obstacle to coitus may be some imperfection or

defect in the penis or generative organs in general; or it may be some idea which prevents necessary erection or physiologic orgasm, thus effectually interfering with the initiation or completion of coitus.

The physical causes of impotence in the male are numerous, but they are, for the most part, included in deformities, congenital or acquired, of the penis. Defects of development of the penis vary in degree from slight anomalies of form and size to complete absence of the organ. The slight imperfections of form, when they do not interfere with erection, are no bar to the normal performance of coitus; but when they are more decided, and of such nature as to cause distortion of the organ in a state of erection, they may render immission impossible. Distortion of the penis in erection is due to some defect or malformation, natural or acquired, of the erectile tissue constituting the corpora cavernosa. Want of development of the corpora would render erection impossible; deficiency on one side would occasion a lateral deviation of the organ in erection; inflammatory changes or deposits in the erectile tissue interfere with uniform distention and thus cause distortion, the degree of which depends upon the seat, or seats, and the extent of the abnormality. Deposits in the corpora cavernosa may be congenital; but inflammatory changes, due to extension of inflammation from neighboring parts or to direct traumatism, are more frequently causes of deformities that result in sexual incapacity. In rare cases the penis is congenitally absent, while the other organs of generation are normally developed. In other cases the penis is so extremely small as to render coitus impossible. In striking contrast with the latter condition is enormous size of the organ, which as effectually prevents sexual intercourse. The penis is sometimes found attached to the scrotum; in such cases a surgical operation will usually render the individual sexually capable if the organ be otherwise normal. Cases of double penis with double urethra have been reported.

Other anomalies of development that may interfere with copulation are hypospadias and epispadias. The former condition is characterized by the orifice of the urethra being on the under surface of the penis instead of at the glans penis (Fig. 228); the latter, by the termination of the urethra being on the upper or dorsal aspect of the organ (Fig. 229). These anomalies are usually attended with more or less marked deformity of the organ as a whole. Whether an individual so affected is sexually capable or not depends upon the extent of general deformity, and upon the position of the urethral orifice. With slight general deformity intromission would be possible, but for the emission of seminal fluid to take place in the vagina the urethral orifice must be well toward the distal extremity of the organ. Even in some cases where the opening of the urethra is in the lower part of the glans penis itself, the consequent misdirection of the ejected seminal fluid prevents its reaching the os uteri, and the individual is practically impotent.

Phimosis may be of such nature and degree as to prevent a normal ejaculation of semen. Such a condition is usually open to surgical correction. Urethral stricture may cause impotence by preventing the

ejection of semen entirely, or by allowing but a tardy and incomplete performance of the act.

Impotence caused by defect or disease of the testicles is to be classed rather as sterility; for in such cases it is the male generative elements that are directly affected. When the generative glands are imperfectly developed the functions of erection and orgasm will usually be imperfect, and such an individual might be classed as both impotent and sterile. In cases where the integrity of the testicles has been damaged by disease the performance of coitus may still be possible, and the case is rather one of sterility than impotence.

Renal disease and affections of the prostate may lead to impotence, manifested in deficient erection and diminished sexual desire. A few diseases not directly implicating the genital organs are attended with impotence, permanent or temporary, depending upon the nature of the

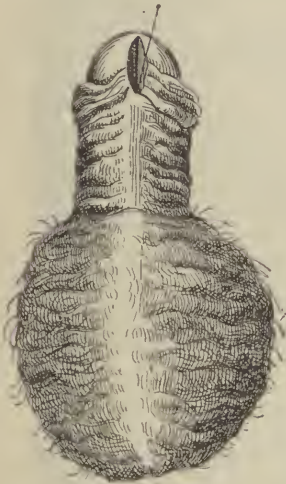


FIG. 228.—Slight hypospadias (Hofmann).

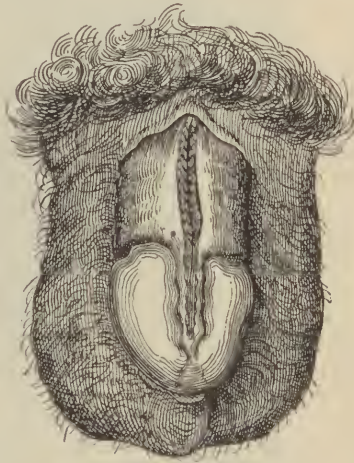


FIG. 229.—Epispadias (Hofmann).

affection. Disease or injury of the nervous paths and centers which control the functions of erection and ejaculation may lead to permanent loss of sexual power. Certain general organic nervous affections, like locomotor ataxia and paretic dementia, often have a similar effect. The importance of these affections as causes of impotence from the present standpoint of discussion lies in the fact that the impotence may be manifested at an early stage of these diseases. In such cases there is commonly a simultaneous failure of sexual desire *per se*, showing functional or organic implication of the brain. Some general diseases affect more or less profoundly the sexual functions, but the duration of the resulting incapacity is usually only that of the cause. Neurasthenia is frequently attended by loss of sexual power. Diabetes mellitus sometimes induces a marked degree of impotence, probably through its tendency to induce changes in the nervous system. Chronic



alcoholism may have a similar effect on the sexual functions, more or less permanent in character. Chronic morphinism, likewise, may temporarily or permanently diminish or destroy virility. It seems probable that the excessive use of tobacco may have a similar effect.

Tumors and enlargements about the male genitals may effectually prevent the performance of coitus, thus making the individual practically, though not potentially, impotent. Such conditions are enormous hydrocele or hernia.

Another fertile source of male impotence lies in sexual excesses. Masturbation or overindulgence in natural sexual intercourse acts in two ways—through the direct weakening influence exerted on the nervous mechanism of the genitals, and the indirect influence exerted on



FIG. 230.—Perineal hypospadias (Curtis).

the nervous system at large. Moderate indulgence in masturbation like moderate normal sexual indulgence, need have no detrimental physical effect, but it may, as a result of a psychic factor, be the direct cause of impotence of a psychic nature, discussed later. Sexual excess acts mainly in a way to exhaust the nervous energy of the genital centers, and to deteriorate the vital qualities of the specific reproductive elements of the sexual glands. Thus, a man so affected may become sterile while he is not yet impotent. Commonly such a condition is amenable to remedy, provided that a profound psychic change, leading to psychic impotence or sexual perversion, has not become firmly established. Instances of impotence due to masturbation and excesses in venery form a series of transitional cases lying between actual physical impotence, on the one hand, and pure psychic impotence

on the other. Indeed, it is rare for a case of impotence due to this cause to be devoid of a marked psychic factor as a contributing cause. In many cases of impotence attributed to masturbation, that cause acts only through the mind. Impotence due to excessive indulgence in natural intercourse is usually physical first, with the subsequent addition of a psychic factor, serving but to intensify and prolong the primary physical condition. Psychic impotence, owing to its frequency and the comparative readiness with which it may be induced in persons apparently normal, is the most important variety of the affection.

Sexual desire is a function of the cerebral cortex. Through the activity of this psychic factor the lower spinal centers are excited to activity, and thus, under normal conditions, the genitals are stimulated to the performance of the generative functions. The genitals and their spinal centers are in a measure independent of the higher cerebral centers, as shown by the occurrence of erection and ejaculation when the nervous paths from the cerebrum have been altered by disease or traumatism, the change in the genitals being then a spinal reflex act. Ordinarily, erection is the result of psychic activity induced by impressions reaching the mind through the higher senses, and it is thus a psychic reflex act. But it is also true that the primary excitant of sexual desire may be excitation of the genitals locally, with the subsequent calling up of associated sexual ideas, which again react to intensify the activity of the spinal genital centers. This psychic element in sexual excitement is by far the most important factor in the sexual act. So important and essential is it, that without it, under normal conditions, erection is well-nigh impossible in mature individuals. Pathologic excitability of the spinal genital centers may induce erection, but without the intervention of the psychic factors it will be transient; or if persistent, attended by pain and discomfort which effectually overcome the element of pleasure, the most essential quality of normal sexual excitement.

The power of certain ideas to induce sexual excitement is counterbalanced by the power of certain other ideas to overcome and prevent it. These inhibitory ideas are the most essential factors in acquired psychic impotence, which includes the majority of cases of this nature. In another class of cases there is a want or loss of the usual ideas of a positive sexual nature. Cases are on record in which there was entire failure to develop sexual desire, notwithstanding normal development of genital organs and normal functional possibility. This congenital condition will be better understood after perusal of the subject of sexual perversion. This failure to develop normal sexual desire is often associated with other mental defects constituting the various degrees of idiocy and imbecility. It should be added, however, that there is no essential relation between intellectual defect and want of sexual desire. On the contrary, in many cases of congenital weak-mindedness there is a virtual or actual intensification of the psychic factor in sexuality, though it is likely, in such cases, to express itself in some perversion of the sexual instinct. This is the more probable in such cases, owing to the impossibility of the development of ideas of morality.

Loss of normal sexual desire *per se* may be induced by many conditions. Thus, the masturbator finds greater pleasure in his act of self-abuse than in normal coitus, and at last the normal psychic excitants of the sexual impulse remain without influence on him. The man who indulges excessively in normal coitus is similarly open to the loss of pleasure in the act, finally resulting in a loss of power to respond to normal psychic stimuli of a sexual nature. Such an individual, if the lower genital centers are not exhausted, is prone to acquire some perverse manner of sexual gratification which has its charm for him in its novelty from a mental standpoint. Cases of this kind are mentioned under Sexual Perversion.

With advancing years, after full maturity, there is a normal lessening of intensity of sexual desire, usually accompanied by diminution in the functional power of the spinal centers, but this is not always the case; indeed, sexual desire may outlast physical virility, and thus induce sexual perversion. The duration of virility, however, is not to be measured by years, for sexual power, like all other functions, is a matter of individuality.

Acquired psychic impotence is also possible as a result of actual brain disease. Cerebral exhaustion, as seen in general neurasthenia, or from any cause, might prevent the psychic reflex. Organic disease implicating the brain or the downward conducting nervous paths may have a like and lasting effect.

Psychic impotence due to inhibitory ideas may be understood through examples of psychic inhibition in other relations. Thus, the inexperienced declaimer is commonly deprived of speech and memory when confronted by his audience. Try as he will, he cannot articulate a word of his well-learned speech; even the glands that provide moisture for the mouth refuse to perform their office. Some men of unusual modesty are incapable of micturition in the presence of strangers of their own sex. In this mental inhibition the idea of possible failure frequently is all there is to induce inability to perform some act, which would have been carried out had not the suggestion of failure arisen in some way. Under such circumstances the inhibitory idea acts more powerfully than the opposing positive idea, no matter how strongly accentuated by desire. A man of usual moral training is unable to perform coitus save in favoring circumstances of privacy. Any change of those conditions would effectually prevent erection; similarly, any interruption during the act would prevent its completion. Even when sexual excitement has reached an active degree under favoring circumstances the accidental interposition of unrelated ideas will ordinarily cause cessation of all sexual thought. These examples show how easily normal sexual thought is disturbed by intercurrent ideas, the ordinary cases of psychic impotence thus becoming clear.

Temporary impotence due to fear or modesty is not unusual in men who attempt coitus for the first time. Those who have practised masturbation and have had access to the evil suggestions of quack literature and medical works on sexual neurasthenia are often rendered



psychically impotent by the thought and fear of impotence. Failure under such circumstances may give rise to prolonged and even incurable impotence. The same is true in cases of men who have overindulged sexually, who, when they come to marry, have a doubt arise which renders them impotent with their wives. The power of habit and association in the performance of the sexual act may operate similarly. The circumstances attending the first sexual excitement and gratification in some individuals exercise a powerful effect on the subsequent activity of the sexual functions. The well-known case of the boy who was impotent for all women except those dressed like and resembling the girl with whom he had his first experience is a case in point. Men who have grown accustomed to the manners of prostitutes, when they marry may be impotent for lack of the long-accustomed stimulus which the wives, in their natural ignorance and modesty and comparative coldness, cannot offer. The habitual masturbator may be psychically impotent because he misses, in attempt at intercourse, the pleasure he finds in his habit.

Another form of psychic impotence is that due to overintensity of sexual excitement, as a result of which the sexual orgasm occurs before immission is possible. This form is apt to affect the inexperienced, and in some cases it becomes so confirmed as to render the individual practically impotent. Pathologic hyperexcitability of the sexual centers, as a stage in sexual exhaustion, may lead to the same result.

**Impotence in the female** may be due to a great variety of anatomic conditions which act to prevent the proper performance of coitus, *e. g.*, absence of vagina, grave deformities of the pelvis, adhesion of the labia, imperforate hymen, too dense and resisting hymen, atresia of the vagina, etc. Tumors about the genitals may have a similar effect.

Fissures and ulcers at the introitus vaginae, and even at the anus, are fertile causes of the condition called vaginismus, in which, on an attempt at coitus, the constrictor muscle of the vagina becomes so firmly contracted that *immissio penis* is impossible. In some of these cases pain is the essential factor; but in others, fear or an idea is the disturbing element that renders coitus impossible, and the woman might properly be called psychically impotent.

The woman's part in the sexual act is so essentially passive that it is much less open to disturbance than that of the man. Many women are, doubtless, never truly excited sexually, and never experience a complete sexual orgasm. A woman may have such a mental aversion to the sexual act as to prevent its normal completion on her part, and such a state of mind might lead to a persistent refusal to indulge in it—a state of true psychic impotence. Passive submission, under such circumstances, might suffice to satisfy the husband, but where the aversion on the part of the wife becomes so excessive and troublesome as to constitute a bar to ordinary indulgence, it might, like serious anatomic obstacles, constitute a ground for divorce.

## STERILITY

**Sterility in the male** must be dependent upon some anomaly of the testicles or of the seminal passages. Absence of the testicles or of the seminal canals would, in either case, cause complete sterility. Congenital absence of the testes is very infrequent. Castration after the age of puberty would not necessarily cause complete sterility until after the seminal passages had been emptied of all contained spermatozoa. It should be remembered that castration in itself does not necessarily remove the possibility of erection and coitus. The loss of one testicle need not interfere with procreative power if the other be normal. Absence of the testicles from the scrotum is in itself no sign of sterility, since in rare cases they do not descend.

The function of the testicles is the secretion of semen and spermatozoa, and the semen depends upon the presence of the spermatozoa for its fecundative power. This function begins with the occurrence of puberty. The age at which puberty is established varies somewhat with race, climate, and education. With us it occurs from the fourteenth to the eighteenth year. Sexual development is of gradual growth, as is evidenced by the gradual development of the changes of general form, growth of beard and genital hair, change of voice, etc. Premature excitation of the sexual organs and the cultivation of sexual thoughts have an undoubted influence to hasten sexual development. Age is much less to be relied upon as an index of sexual maturity than other conditions manifest in the individual. Cases have been reported of sexual maturity before the age of twelve. Erection occurs in very young boys, and it is doubtless true that erection and ejaculation of semen occur at an age when the semen has not yet attained fecundative power.

Just as sexual desire diminishes in old age, so the fecundative capacity decreases; but it is impossible to give any fixed period at which the latter ceases. Men of very advanced years are sometimes capable of procreation.

Congenital defects of the testicles are not of frequent occurrence, but in some cases the testicles remain undeveloped. Such anomalies are often associated with other bodily imperfections of development and with mental deficiency. Atrophy of the testes occurs as a senile condition, but it frequently is manifested earlier in life as a result of various conditions. Excess in sexual intercourse and masturbation are capable of inducing it. It is also frequently the result of inflammatory processes affecting the testicles and epididymis; and it may result from extraneous pressure, as in varicocele. Atrophy of the prostate gland occurs with atrophy of the testicles, a circumstance that is now taken advantage of in enlargement of the prostate, castration being followed by atrophy of the latter. Injury or disease of the spermatic nerve in its origin or course entails progressive atrophy of the corresponding testicle. Alcohol and morphin, when long indulged in, may cause sterility. Fatty degeneration of the testicles is likely to occur in very

stout persons, just as a similar change affects other organs in such persons. Probably in progressive atrophy of the testicles the secretion of the spermatozoa diminishes and ceases before there is any decided change in the secretion of the semen. Such a person might thus become sterile long before becoming incapable of erection and ejaculation. Inflammation of the spermatic ducts and the epididymis of gonorrheal origin is, perhaps, the most frequent cause of impotence. The canal becomes obliterated at some point, and the fluid ejaculated thereafter is secreted along the remaining pervious portion of the ducts, and contains no spermatozoa. To induce sterility both ducts, of course, must be impervious. After coitus has been often repeated, the semen last ejected may be poor or absolutely wanting in spermatozoa—a temporary condition. Doubtless certain general diseases of an exhausting nature have a similar temporary or permanent effect. Rare must be the cases in which, in an absence of disease, spermatozoa are absent congenitally.

Absence of the vas deferens as a congenital defect must be very rare. As already indicated, it is frequently obliterated in inflammatory processes. This in itself does not cause orchitic atrophy. The ejaculatory duct is liable to injury in the operation for stone, and cases of sterility after perineal lithotomy are on record. The power to ejaculate semen may thus be lost, though coitus (immission) may be still possible.

**Sterility in the female** is by far more frequent than in the male. A woman's years of fruitful sexual activity are much more definitely fixed than a man's. Capability of conception begins with the occurrence of menstruation, and continues during the time of the periodic recurrence of that function. Menstruation begins usually from the twelfth to the eighteenth year, depending on individual development. It has been known to begin in infancy and continue regularly to recur. It is presumable that in such cases the capability of conception has not undergone a corresponding precocious development, but instances of impregnation at a very early age—eight years—are well known; and the development of ripe graafian follicles takes place long before the attainment of puberty. It is important to remember that female sexual maturity may occur before menstruation appears; indeed, menstruation may be long delayed, and occur for the first time after one or more pregnancies, or not at all, though there be no other sexual anomaly. Capability of conception usually ceases between the ages of forty and fifty. As a rule the cessation of menstruation is a sign of loss of power to conceive, but it does not in itself imply that power to conceive is gone, for in rare instances women have conceived one or more years after the menopause. It is rare for women to conceive after the age of forty-five, but well-authenticated cases are on record where the age was above fifty, one at fifty-five.

Sterility in the female may result from a great variety of pathologic processes and conditions. Congenital absence or defect of the ovaries occurs, but usually with other genital defects, as in certain cases of



so-called hermaphroditism. Acquired absence, as a result of surgical operation, is, unfortunately, becoming too frequent. Both ovaries must be entirely wanting to induce sterility from this cause, for any portion of them is sufficient to allow conception. Ovarian tumors may or may not cause sterility, depending upon complete or incomplete destruction of the organs. Other diseases of the ovaries and tubes may cause sterility, especially double salpingitis and pelvic inflammatory processes. Congenital absence or defect of the uterus precludes conception. In some cases of this kind the condition of the vagina still permits coitus. Versions and flexions of a uterus otherwise normal are very frequent causes of sterility, probably owing to pathologic processes so common to uteri in abnormal positions. While fibroids and carcinomata of the uterus are ordinarily obstacles to conception, they are not always so. The various forms of uterine inflammation, deformities of the neck, and leukorrhea are fertile causes of sterility, but they are not necessarily followed by it. Narrowness of the vagina, even almost complete closure of it at some point in its course, is not invariably a cause of sterility. This follows from the fact that complete *immissio penis* is not in itself essential if there be a way for the spermatozoa to find an entrance from the external genitals. Vesicovaginal fistula may form an insurmountable obstacle to conception.

While a woman may be capable of coitus and conception, she may still be unable, as a result of disease or deformity, of bearing a child. Such a condition might, like those previously considered, be a cause of medicolegal inquiry.

Questions that arise in connection with impotence and sterility are concerned with the duration of the condition previous to the time of its discovery and its probable continued duration. In some cases, as may be seen from the foregoing, it is easy to answer these questions; in others, only a guarded opinion and prognosis can be given. Both must be founded upon careful observation of the case and a wide experience with allied cases.

# RAPE

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RAPE is carnal knowledge of a woman by a man, accomplished by force against the will and without the consent of the woman. Carnal knowledge is constituted by penetration, even in the least degree, of the female genitals by the male organ. That this shall constitute rape, the facts of force, resistance, and absence of consent are legally essential. The force used must have been sufficient to accomplish the purpose, but it need not be actual physical force; moral force, quite as compelling as physical force, may be exerted by means of threats of physical violence or other manner of injury, and this need not be directed immediately against the victim, as where threats against husband, children, or other relatives compel submission. Intercourse accomplished by means of deception, where there has been neither threat nor purpose to use violence or force of any kind, is not rape in the eyes of the law.

Resistance is the most immediate expression of the act being against the will of the female. This must have been manifested positively by her, or she must have been in a physical or mental condition precluding its expression, to make an act of intercourse with her rape. Absence of resistance as a result of physical incapacity, narcotism, or mental disease is not construed to change the character of an unlawful act of intercourse.

Lack of consent is construed generally to imply that the act is against the will, and the legal treatment of "consent" is thus of primary importance in any consideration of rape. The law fixes the capacity of the female to give consent more or less definitely by her age. Intercourse with a female who has not attained the age of consent is, in general, felony; under some enactments it is a misdemeanor; where the child is between the ages of ten and twelve, and gives consent, it is a misdemeanor. The age of consent in the majority of the middle states is fourteen; in New York, it is sixteen. Beyond the age of consent, where consent to intercourse is given, even with the greatest reluctance, there can be no question of rape.

The capacity of the male to commit rape is also affected by age and other conditions. The male must be physically capable of intercourse. In English law the perpetrator must have attained the age of fourteen, but in the middle states some courts have held that age does not, in itself, furnish proof of incapacity. Proof of impotence constitutes no defense for *attempt* to commit rape.

The victim of rape is a competent witness, but it is necessary to corroborate her testimony when guilt is denied. The medical witness will,

in many cases of alleged rape, be called upon to give evidence touching the question whether penetration has taken place or not, and whether force was used. As already indicated, the fact of penetration is the only essential part of intercourse that needs to be established as an element in rape.

Examination of the female genitals is the only means of determining physically whether penetration has taken place or not, and it is, therefore, necessary to consider the changes induced in the female generative organs by coitus.

In their virgin state the female genitals present the following characteristics: the labia majora are firm, large, and well rounded, their median surfaces lying in close contact and covering completely the labia minora, the mucous membrane of the latter being of a bright rosy tint. The vestibule is narrow; the hymen is intact; and the vagina is narrow, presenting marked folds of its mucous membrane. The condition of the labia majora depends far more upon the state of general nutrition, age, and position than upon anything else. Coitus, frequently repeated, will cause no change of the virgin state of the labia if the female is young and well nourished. As a woman grows older the subcutaneous fat may diminish, and a virgin under such circumstances would present more or less marked separation of the labia majora. The same is true in women emaciated from any cause. Separation of the thighs is normally attended by more or less separation of the labia. The rosy tint of the labia minora depends upon the protection given by the labia majora; where they remain uncovered by separation of the latter, the mucous membrane comes to resemble epidermis, in being brownish and dry. Thus the condition of the labia and nymphæ can give no unequivocal evidence of the existence or absence of virginity.

The hymen, owing to its structure and position, is capable of giving more decisive evidence of virginity or defloration. The hymen from the earliest times has been regarded as the sign of virginity, but more careful study of its variations and the alterations to which it is subject has markedly modified earlier views. It was long regarded as a fold of mucous membrane developed at the orifice of the vagina, but it is the representative in the female of the corpus spongiosum, and thus represents an organ modified by arrest of development. This morphologic identification of the hymen accounts for its constancy—there is no authentic case of its absence—and the numerous variations in form to which it is subject. It makes its appearance soon after the fourth month of fetal life, in the form of two folds at the opening of the urogenital sinus, which later fuse in the median line, save at the hymenal opening. The primitive folds of the hymen extend forward to embrace the clitoris, and their union in the median line of the vestibule forms the frenum masculinum. The folds of the infantile hymen may be prominent, while the vestibule is relatively deep seated, and at this early age the hymen may be mistaken for the nymphæ. When the hymen is deep seated a persistence of the usual infantile condition,



the erroneous conclusion of its absence, may be drawn. Commonly the fully developed hymen is thin and membranous, with an opening leading to the vagina; but there are numerous variations from this form. The hymen is sometimes thick and fleshy, offering an insurmountable obstacle to coitus; in other cases it is so thin and elastic that coitus and even labor are possible without its rupture.

The bearing of these possible states of the hymen upon the question whether coitus has taken place or not is obvious: an intact hymen, strong and unyielding, with a small hymenal orifice, would be conclusive evidence that complete penetration had not been had; an intact elastic hymen would not afford unequivocal negative evidence.

In childhood the hymen frequently has the labiated form, a continuance of the fetal condition (Fig. 231). Fusion of its folds sooner or later gives rise to the ordinary annular form (Fig. 232). The common annular hymen varies in shape with variation of the size and posi-



FIG. 231.—Hymen with linear opening (Tardieu).

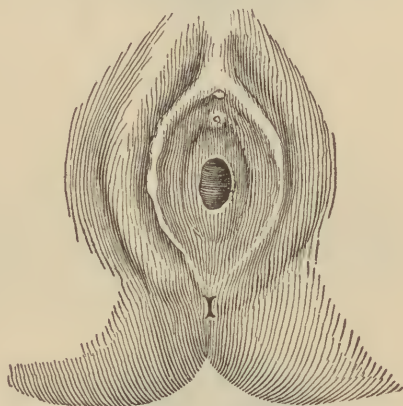


FIG. 232.—Annular hymen (Tardieu).

tion of the orifice. When the opening is large the hymen may be nothing more than a membranous fringe at the vaginal entrance. Usually the opening of the hymen lies anteriorly to the center of the entrance of the vagina, when the hymen will be more or less crescentic if the opening extend forward to the anterior edge of the vaginal wall (Fig. 232). The opening may be circular, but it is more often oval, with the long diameter extending anteroposteriorly. The size of the hymenal orifice varies within wide limits: it may be so large that there is no narrowing of the *introitus vaginæ*, or it may be so narrow that it will allow the passage of only a small sound.

*Imperforate hymen* is a rare condition; *atresia vaginæ* may be mistaken for it. When the opening of the hymen is long and narrow, the hymen presents two symmetric halves, and is called labiated, as in its early form. Varieties of form due to peculiarities of the free edge of the hymen have received particular designations, the most striking being the fimbriated hymen, characterized by the edge presenting

numerous minute processes giving the appearance of fringe (Fig. 234). This fringed condition is but a marked development of notches that are present in many cases. These notches, owing to the fact that they may be readily mistaken for evidences of rupture, are of much



FIG. 233.—Crescentic hymen.



FIG. 234.—Fimbriate hymen intact.

medicolegal importance. Such indentations may be situated almost anywhere on the edge, but they usually occur symmetrically and anteriorly. They may be of any depth, even extending to the vaginal wall and dividing the hymen into valves (Fig. 235). To avoid mis-

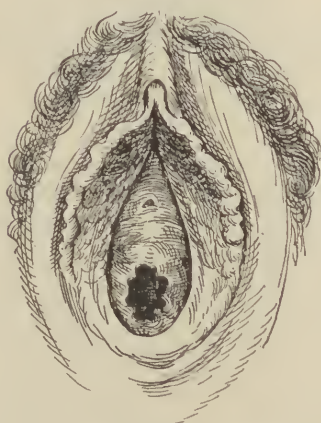


FIG. 235.—Circular hymen presenting natural notches.



FIG. 236.—Hymen presenting a septum and unequal openings.

taking such natural irregularities for artificial tears, all that is necessary is to note the absence of cicatricial tissue and the integrity of the mucous membrane at the suspected points.

The normal single opening of the hymen may be found divided by

a septum into two equal or unequal apertures (Fig. 236). The septum usually extends anteroposteriorly, but its direction may be oblique. There may be, however, but one lateral opening. The remnant or



FIG. 237.—Hymen with posterior rudimentary septum.

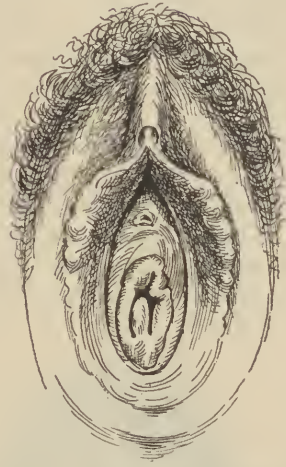


FIG. 238.—Hymen with posterior rudimentary septum.

rudiment of a septum is seen rarely as a long slender process with a posterior attachment (Figs. 237 and 238). The cribriform hymen is a rare form, presenting numerous minute openings.



FIG. 239.—Purse-like hymen undistended.

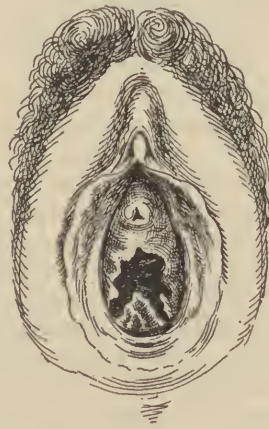


FIG. 240.—Crescentic hymen presenting two lateral lacerations and posterior valve.

It is important to note that the condition of the hymen varies with variation in the position of parts about it. It does not present as a tense membrane. With the genitals in their usual position, the hymen



is folded on itself (Fig. 239). The crescentic hymen has a median anteroposterior fold; the edge of the circular hymen is folded into a cone extending outward. In adults wide separation of the thighs and labia makes the hymen tense, but in children, owing to the greater extent of the hymen as compared with the *introitus vaginæ*, it ordinarily remains lax under like circumstances.

Strong presumptive proof of virginity is presented by an intact hymen, but its value must be decided by consideration of the peculiarities of the hymen itself—its elasticity, the size of the opening, etc. It is to be remembered that “penetration” does not imply penetration beyond or even to the hymen. It must be remembered that gradual dilatation of the hymenal opening is possible.

Usually the hymen is torn more or less in the first act of coitus. Of course, the nature of the hymen will have much to do with the peculiarities of the resulting lacerations. Such tears commonly start

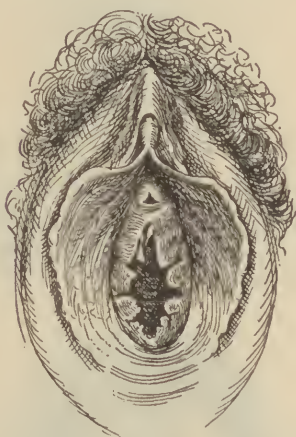


FIG. 241.—Circular hymen torn in several places.



FIG. 242.—A ruptured fimbriate hymen.

from the edge and extend to the vaginal wall. The labiated hymen is ruptured posteriorly in the median line; the crescentic hymen tears symmetrically on each side, leaving a posterior median valve (Fig. 240); the circular hymen commonly tears in several places (Fig. 241). Much will depend upon the comparative weakness of the parts of the hymen in determining the direction and character of lacerations. The hymen divided by a septum may be ruptured on only one side.

Rupture of the hymen is quite invariably accompanied by hemorrhage; it has even been known to occur with such profusion as to cause grave alarm and even endanger life.

It cannot be difficult to recognize a recent rupture of the hymen, the unhealed edges of the laceration, and the inflammatory swelling of the parts remaining as conclusive evidence. Slight lacerations of the hymen heal in two or three days; more severe tears may require much

longer before repair is complete. At any time before healing has taken place and inflammatory swelling has subsided the diagnosis of rupture is easy; but it may be difficult at a later period. Much will depend upon the extent of the lacerations and the consequent formation of cicatricial tissue. In cases of slight rupture at this period special care must be taken to distinguish between presumptive tears and natural notches. Examination of the hymen for possible evidence of rupture should be conducted with care to avoid inflicting injury that may subsequently be mistaken for a previously existing tear.

Rupture of the hymen, since it may be due to many causes, is not conclusive evidence that coitus has taken place; but it is rarely possible for the hymen to be injured without penetration of the genitals to some extent. Forcible separation of the thighs has been alleged as a cause of rupture of the hymen, but such an event is hardly possible, especially in children, unless neighboring parts are simultaneously implicated in the laceration. Isolated rupture of the hymen by a fall on the perineum, unless impact were on a projecting object, would be a rare accident. The practice of masturbation may lead to injury simulating evidence of coitus, but this must be infrequent in children; for in them the irritative rubbing is directed quite exclusively to the clitoris and inner surface of the labia. Persistent pruritus in children is more likely to lead to injury of the hymen than the common habit of masturbation. Children frequently attempt to pass objects into the urethra, but usually leave the entrance of the vagina untouched. Scars on the hymen may be the result of diseases like smallpox, noma, diphtheric inflammation, and venereal diseases.

The first act of coitus may inflict injury involving other parts as well as the hymen. The delicate structure of the fourchet renders it liable to such injury; and even rupture of the perineum and laceration of the nymphæ are reported from this cause. Such an event in the case of a mature female must be very rare, but in a child it would seem more easily effected. The presence of such extensive lacerations at once raises the question of the manner of their infliction; for the limited power of the penis to overcome resistance would indicate that they were due rather to the use of the finger or other more rigid object. Penetration of the finger may cause rupture of the hymen like that due to coitus, but it is also capable of inflicting much more serious and extensive injury.

The vaginal walls and mucous membrane present characteristic folds in the virgin, and this condition is altered only by repeated acts of coitus. In children, if the vagina has been distended, there may be evidence of it in the dilated condition of the passage.

The presence of semen in or about the genitals of an alleged victim of rape is incontestable evidence of sexual contact. This proof must be sought in the secretions of the parts, and in any dried secretions obtainable from the genitals or clothing. The characteristic element of semen is the spermatozöon, which may be found as readily in dried secretions as in fluid. The spermatozoa retain their form indefinitely

in seminal stains that have been dried. Skilful examination for them with the microscope is, of course, necessary.

The existence of venereal disease in the person of an alleged victim of rape is often of great importance as evidence of sexual contact. In such cases the medical witness has need of great caution in diagnosis, as well as of great care in giving an opinion. The true venereal affections are easily simulated by more innocent conditions, at least upon superficial examination. Gonorrhea may be positively diagnosed by the discovery of the gonococci, but failure to find them in the secretions is not a demonstration of the non-venereal nature of a genital catarrh, for in the later stages of the disease the gonococci may be found only with great difficulty or not at all. In acute gonorrhea the gonococci are found in the vaginal secretions and in the moisture on the inner surface of the labia; in the chronic stages they may be found in the cervical canal and in the urethra. Thus, failure to find gonococci in the discharges accompanying an acute genital catarrh would support the presumption that the disease was of a non-venereal nature. It should be remembered that existing venereal disease is not direct proof of sexual contact, no matter how strong it may be as presumptive evidence of it. The genitals may become infected in many other ways. Children have developed gonorrhea from using articles infected by others. Genital infection is possible from infected hands, directly or indirectly. Syphilis may be communicated in various ways aside from sexual contact, especially by kissing. Simple genital catarrh is not uncommon in female children and adults; it is of frequent occurrence as a result of the first coitus, especially when there was preëxisting leukorrhea. Suits for divorce have been instituted on the erroneous assumption that the inflammation thus arising was specific. Females that have been raped may present such an acute inflammation, which, if mistaken for gonorrhea, may give opportunity for a false defense in that the ravisher may prove himself devoid of disease. Other common causes of mucopurulent genital catarrh in females are disordered menstruation, masturbation, skin diseases, oxyuris, and any general enfeebled state of health. Genital catarrh is sometimes epidemic, and the genitals are subject to diphtheric inflammatory processes.

Simple ulcerative processes affecting the female genitals are usually easily differentiated from those of a specific nature; but syphilitic sores are not always indurated, and simple ulcers may be indurated and simulate the hard chancre. Soft chancre can be diagnosticated by auto-inoculation; and it may be necessary to distinguish it from herpes.<sup>1</sup> The genitals of female children may be affected with ulcerative processes after scarlet fever, typhoid fever, and measles.

It will be seen that there are indefinite possibilities of cases arising in which great care in diagnosis must be exercised. Even the incubation and course of venereal affections become important, since it may be necessary to give an opinion affected by the time of alleged

<sup>1</sup> The bearing of modern means of diagnosis of local and systemic syphilis, as possible aids in cases in which these questions are raised, is obvious.



infection and the stage of a malady found at the time of examination. The importance of these points is further emphasized by the frequency of false accusations, to be discussed hereafter.

Examination of the accused may be of equal value for the establishment of guilt and innocence, but it can be practised only with the consent of the accused. It is especially important in respect to venereal disease, when a similar affection is found in both victim and ravisher. Acute gonorrhea in the male is certainly diagnosticated by the microscope, but a gleet more easily escapes detection, and precaution should be taken accordingly by the examiner. A gleet is less infectious than an acute gonorrhea; on the other hand, the genitals of virgins and female children are more readily infected than those of women that have been accustomed to coitus. Sexual contact with a diseased male is not always followed by infection of the female; nevertheless, presence of the disease in one and not in the other of the two individuals forms strong presumptive proof that they have not had sexual contact.

When the accusing female is one that has frequently practised coitus, the single act of normal coitus will leave no anatomic evidence behind; in such cases, however, there is not infrequently evidence of the force used about the genitals or elsewhere on the person of the victim.

Physical evidence of force used in the accomplishment of rape affords tangible proof that the act has been accomplished against the will of the female, and the medical witness may be called upon to interpret such evidence. Severe or serious injuries resulting from blows, choking, or brutal physical violence are a direct measure of force used; slight injuries should be viewed also in the light of the possibility of their having been self-inflicted, especially with reference to their situation on the person of the victim. Unless the victim is examined soon after the violence has been used, slighter marks of it, like bruises and scratches, may have disappeared; wounds and extensive abrasions are in evidence longer. Such evidences of the use of force may be found in almost any situation on the person, but the neck, thighs, arms, and external genitals are most frequently the seat of injury. Natural pigmentations have been mistaken for suggillations. Injuries are always to be considered with relation to their condition and the alleged time of their infliction.

Signs of violence found on the person of the female speak also for the degree of resistance she has offered to the sexual approach. The law demands that a woman exert all the resistance of which she is capable. In many cases the signs of violence on her person and on the person of the ravisher show that resistance has been strenuous and quite adequate to her physical strength; but absence of such evidence of resistance must not be construed as conclusive proof that the woman has not offered all the resistance of which she was capable. The physical condition of the victim is not alone to be considered; it should be remembered that nothing is so likely to cause temporary psychic paralysis in a woman as a violent and unexpected sexual approach. Fear of intent or threat to inflict bodily injury is a potent source of

failure to use strenuous physical resistance. Attempts to gain help by outcry are means of resistance, but even failure to make use of this is not evidence of failure to resist when fear or psychic paralysis intervenes to prevent the cry of alarm. Lack of proportion in physical strength is usually in favor of the man, but not always; and even where the woman is the stronger, the mental factor of feminine timidity and possible surprise should be considered. The frequency of false accusations makes it necessary, however, to keep in mind the bearing of relative physical strength in the two persons.

Signs of violence on the person of the ravisher may be found in the form of scratches, bruises, and wounds made by bites; the male genitals often present signs of slight or even severe injury. Such findings are indicative of the degree of resistance offered by the victim.

When the possible power of resistance is overcome by fear aroused by threats, no matter what their nature, the moral force thus employed is equivalent to physical compulsion. The possibility of resistance may be precluded by physical infirmity or by mental conditions more thoroughly discussed in a subsequent paragraph. When fraud has been the means of accomplishing coitus, the act cannot legally be construed as rape unless it can be shown that there was intention to use force, which the success of the fraud made unnecessary. Thus, for example, coitus accomplished under cover of darkness, the woman mistaking the ravisher for her husband, is not rape. This seems logically inconsistent; for commonly unlawful intercourse with a woman narcotized by drugs or intoxicants is rape; and it would seem that deception, however practised, since it precludes the action of sound judgment as readily as do narcotics, should be viewed in the same light.

Unlawful connection with a woman had while she is in a state of unconsciousness is commonly rape; it matters not what the cause of the unconsciousness may be. It is possible for coitus to be had with a woman while she is asleep; but it would seem necessary that she be in a state of profound sleep, and a woman accustomed to sexual contact. The first act of coitus would certainly arouse a woman from any ordinary slumber. Sleep, a favoring position, and the absence of impeding garments might so facilitate the initiation of a sexual approach that, when the woman had become aroused, her resistance would prove futile. Pathologic or artificial states of unconsciousness are commonly deeper than normal sleep, and are the more readily taken advantage of for a sexual purpose. This is commonly interpreted as rape. Such a condition may be induced with a view of using it to facilitate sexual approach. When a woman has been induced to take some common form of alcohol, and her subsequent state of intoxication has been used to facilitate sexual congress, the case is not so simple as to constitute rape without other consideration. If in such a state she offer resistance, it is rape; if she give consent, unconsciousness or acquiescence must be proved to make the crime rape. Under such circumstances it would be assumed that an adult female was aware of the effects of the ordinary

forms of alcohol, and her consent to take that which lowers moral tone would help to lessen the responsibility of the accused. In the case of a young and ignorant girl, her indulgence in alcohol and subsequent consent in a state of intoxication should not lessen the degree of responsibility of her ravisher.

Any of the narcotics, but especially chloroform, ether, nitrous oxid, opium and its alkaloids, and chloral hydrate, might be administered with a sexual object in view, but there are only a few cases in which this has been actually done. In most recorded cases where such agents have played a part in rape the narcotic has been given for some other purpose, and the unconscious state has offered a favorable opportunity. It is possible to chloroform a sleeping person without breaking the slumber, but it requires great care and skill, and the chances of failure and success are about equal even under most favorable circumstances. Other states of temporary unconsciousness might be used for sexual purposes; syncope, epileptic unconsciousness, cataleptic and hysteric conditions, and the hypnotic state may be mentioned in particular. However, accusations of rape based on testimony related to such states of mind should be most carefully scrutinized, since such cases have been repeatedly shown to be instances of intentional or delusional false accusation.

The frequency of false accusations of rape is notorious, and demands particular discussion. The possibility of such a state of the case should never be left out of account in any instance. Motives of such false charges vary; they may be made with the purpose of revenge, blackmail, or even ignorantly; or they may be the result of hallucinatory or delusional ideas. When false accusations are made from motives of revenge or for the purpose of blackmail, attempts often are made to manufacture evidence of a physical kind corroborative of the charge. The female may inflict injuries on herself to counterfeit signs of violence. Such injuries are usually trivial in nature, and are situated on parts of the person easily accessible to her hands—*i. e.*, the limbs and genitals. Such self-inflicted injuries are more likely to be present as abrasions and scratches than as bruises. In cases where there are signs of violence care is always to be exercised to study them with relation to their condition and the time of their alleged infliction.

False accusations, made by designing women for the purpose of blackmail, are on record. After exciting genital inflammation in their children, they have made this the basis of complaint. Ignorance of the fact that young children are often subject to acute genital catarrh of an innocent nature has often led to trials for rape, on the assumption that a child was suffering with specific venereal disease. Men who have been innocently associated with such a child are the easy victims of such a combination of accidental disease and common ignorance and suspicion.

Another class of false accusations is based on the complaint that some narcotic, like chloroform, was used to produce unconsciousness. Such a charge should be circumstantially investigated to ascertain



whether the alleged facts pertaining to the administration and action of the drug in question are in accord with known characteristics of its action; or whether, in case the agent is not known, they correspond with the action of any known drug.

False accusations of rape committed during pathologic states of unconsciousness demand most careful study; for such mental states are often followed by hallucinatory and delusional ideas that may have had origin in dreamy ideas present in the unconscious state. In these and allied cases, in order to render the accusations convincing, they should be substantiated by objective evidence of the most unequivocal kind. The instant a plaintiff attempts to describe events that took place while she was unconscious, the testimony is invalidated; but it is to be remembered that even so-called states of epileptic unconsciousness may leave behind a dreamy summary of events that took place during its continuance.

There is no doubt that the hypnotic state might be induced and used for a sexual purpose. Accusations of rape based on such a condition, however, call for the greatest caution in the expression of an opinion by the medical witness. States of unconsciousness may be induced by hypnotic procedures and suggestions, or the subject may be placed in a state in which she is devoid and incapable of will, entirely controlled by the operator, but perfectly conscious of what takes place. It is to be remembered that the hysteric are very amenable to hypnosis; that the hypnotic state of mind is pre-eminently hallucinatory, and, therefore, a favoring soil for the growth of lasting delusions; that the hypnotic state of unconsciousness is abnormal in itself; therefore testimony derived from such mental states should be accepted only with a full understanding of these facts. The celebrated trial of the hypnotist Czinski, in 1895, who was convicted of a sexual crime, as published by Enke, of Stuttgart, contains a lengthy and instructive practical review of the opinions of authorities on this subject.

Autohypnotic and cataleptic states are to be viewed in a light like that essential to an understanding of hypnosis induced by a second person.

Physicians and dentists are especially open to the danger of being subjected to false accusations by females; commonly such complaints are based upon a state of unconsciousness existing during the action of some anesthetic. The most frequent form of accusation is that, during the state of unconsciousness, while deprived of all power of will or resistance, the assault was made. Such a statement should be scrutinized carefully and corroborated by other evidence, if possible, before it is given decisive weight; for there are cases on record where such complaints were shown to be hallucinatory by the testimony of the most disinterested witnesses—and even by parents of the girl—who were present at the time of the alleged assault.

False accusations of rape are often made by women while in insane conditions; the possibility of such an event must never be allowed to outweigh the necessity for caution in crediting statements of a sexual

character made by an insane female. Objective evidence should be required.

When a considerable period has elapsed between the date of the alleged assault and the lodging of the complaint, unless the delay is obviously the result of innocence, shame, or ignorance, the possibility of a motive of revenge or blackmail should always be considered. Physicians, perhaps, more than men of any other class are open to false accusations of a sexual nature, made by designing females with the purpose of blackmail; this possibility is to be remembered in such cases.

When an idiot, imbecile, or insane person is the subject of a sexual assault the crime is commonly rape, for, aside from resistance and force, such persons are incapable of giving legal consent; but it would also be essential for the prosecution, in such a case, to prove that the ravisher was aware of the irresponsibility of the female.

Since the age of consent, in the case of youthful females, is the pivotal point upon which the crime of rape turns when coitus has been accomplished without force, it would seem that the actual and apparent age should be considered in case the offender yielded to solicitations by one apparently beyond the age of consent.

It is a sad fact that the most frequent sexual crime is assault of female children ranging in age from babyhood to early girlhood. Such assaults in Europe are sometimes due to the belief that intercourse with a virgin (child) cures gonorrhea; sometimes to the hope that childish ignorance and weakness will make resistance slight or success easy; sometimes to fears of impotence on the part of the male, who hesitates to make an attempt with an adult through fear of ridicule (the inexperienced and the senile). It is possible that a debauché might attempt to find lost pleasure by such a crime. A true sexual perversion might express itself in a preference for children. Of course, in many cases children are the accidental victims of proximity to a man inflamed by inordinate passion under favoring circumstances. In cases of rape of very young children the sexual contact without serious injury can consist of nothing more than vulvar penetration. Where the genitals are found wounded or torn after such an attack the lesions are usually the result primarily of attempted dilatation by means of the finger or other hard object. But the genital passage of a child is capable of being greatly dilated by repeated gentle efforts; and such disproportionate dilatation, without lesions, should lend color to the suspicion that a child presenting such an anomaly had been improperly approached.

There are secondary consequences of rape that may raise important legal questions. Impregnation entails additional liability in law. Aside from the secondary consequences of the venereal affections, injury inflicted in a rape may lead to serious or even fatal secondary results. Death may speedily result from shock, hemorrhage, or grave injury; or it may follow later from sepsis or hemorrhage into the central nervous system. The peritoneal cavity is especially liable to injury or secondary implication. In any case where a physician is called upon to examine

the subject of a sexual assault it is his duty to proceed with rigid asepsis, to avoid the possibility of having secondary consequences attributed to his neglect.

Sexual congress with male children by adult females is in some of the states punished as indecent assault. The most serious consequences of such a crime are moral injury and venereal disease, but it is not an offense of great medicolegal importance.

Some of the questions that arise in connection with sexual abuse, short of intercourse, when practised on children call for discussion, because of the possibility of their raising a suspicion of the graver crime of rape. The disgusting possibilities of a less serious kind are manustupration practised on children; seduction of children to manustuprate the offender; seduction of children for sexual exhibition. But the most important cases of the kind are those in which female children are involved, and which raise the question of actual sexual contact. An appeal in such cases may be made to the anatomic evidence afforded by the genitals, remembering the frequency with which children manipulate their own genitals. Gentle manual irritation would leave no characteristic sign behind. The child confines her rubbing to the vestibule; the elder seducer is more likely to direct his manipulations to the vagina. The conditions found, if not absolutely indicative of sexual contact, as they can seldom be, must depend for interpretation upon less direct testimony.



# UNNATURAL SEXUAL OFFENSES

BY CHARLES G. CHADDOCK, M. D.

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**Incest.**—Of the unnatural sexual crimes none is more offensive to general moral sensibility than the highest degree of incest. Legally, incest is intercourse of man and woman who are related in any of the degrees which law makes prohibitive of marriage.

Incest is unknown to common law, and is a statutory crime, punishable in many states as felony. The most aggravated form of the crime is that which combines incest with rape.

There is a universal repugnance in the human family to sexual relations between persons closely related by ties of blood. The moral sense of savages and civilized people is so offended by incest that it has given rise to the belief that incest is avoided in obedience to an innate instinct of aversion. Such an explanation of the fact is but a change in terms and no explanation at all. Attempts at explanation have been satisfied by the conclusion that the origin of this universal aversion to sexual congress with blood relations is the result of teaching made necessary by experience of the evil results to offspring of consanguineous marriages. Were this an adequate explanation, we should certainly find among savage people instances where the effects of experience had not yet led to avoidance of incestuous marriage—an observation yet to be made. A phenomenon of life, universal in its manifestation, must depend upon something more certain than accident of teaching derived from experience; the more since the experience of inbreeding is not under all circumstances or immediately disastrous to progeny. Observation shows that there is no inherent aversion to marriage of blood relations *per se*, but repugnance for marriage of those that have been associated intimately in the family, or, among primitive peoples, in the tribe. This aversion naturally gave rise to the once wide-spread custom of marriage by capture, the remains of which are still to be found in many matrimonial customs of civilized peoples.

The *raison d'être* of this aversion to incestuous alliances may be discovered by an appeal to known psychophysiologic laws. It is only necessary to consider the psychology and physiology of sexual development to make this clear. Normally, the distinctive mental characteristics of sex are developed comparatively late; they may be delayed in their unfolding even for some time after the sexual glands have begun their functional activity. The primary period of childhood may be spoken of as practically asexual. This period of indifferent

sexuality, physical and mental, normally extending over many years—fourteen to sixteen<sup>1</sup>—is the period of development during which the deepest and most enduring impressions are made on the mind. These early impressions are derived from associations with the family, relatives, or other individuals associated intimately by a common bond of union. In these surroundings the child, for years devoid of sexuality, has no understanding or capacity for sexual attraction; his attachments for mother, father, sisters, brothers are all the result of the pleasure derived from the kindness and protection he receives. Living in this atmosphere, his feelings uncolored by sexual sensibility, the measure of his capability to respond to impressions made by his intimates is soon completely filled, and finally fixed long before his sexuality has become manifest in other than secondary sexual characteristics derived by imitation from those about him of his own sex. Thus, when puberty approaches, the child's capabilities of mental association and emotion related to the members of the family have been completely filled; there is, as it were, no room for further variations of sensibility in relation to them. Suddenly or gradually cognizance of a new emotion, new longings, arises as the sexual glands assume their functional activity. These new feelings, strange and ill-defined at first, cannot be referred to impressions derived from associates of the family—these have all been experienced many times, and give rise to emotions well known and fixed in nature; the new feelings must, if they arise spontaneously, be projected beyond known sources of experience, and ultimately be brought into association with mental impressions derived from individuals alien to the family circle. Should sexual emotion arise as the result of external impressions primarily, this, for the same reason, could be only as the result of impressions made by other individuals than those that have constituted the circle of childhood's intimacies.

The constancy of this extraneous projection of sexual emotion, when once directed, depends upon the psychologic fact that first impressions and associations, especially those of a sexual nature, are practically and almost universally determinate for life; once directed outside the family, sexual sensibility is never normally altered in its tendency.

This explanation of the normal relations of sexual feeling serves also to emphasize the characteristics that distinguish active sexual love from non-sexual affections. The love of husband and wife is active sexual love; intense as it may be and often is, it is easily destroyed, perhaps because it does not date back to childhood, and because it commonly depends upon satisfaction of both sensual and mental needs. Paternal and maternal love is a secondary development of active sexual love, less open to change than that from which it springs, because more selfish or self-centered in its nature. Filial love, the result of early kindness and protection, the very life of childhood, does not change if once developed, but lives on through separations and changes of association that come in obedience to the intense impulsion of sexual passion.

<sup>1</sup> In the conditions, tendencies, teachings, and influences of modern life it is not remarkable to note the increasing precocity of development of sexuality.

Absence of this aversion to incestuous relations may be due to a variety of causes. A child whose sexuality was prematurely developed as a result of individual peculiarity or evil teaching might be deficient in this respect until properly taught. If mental development were deficient or delayed, incestuous tendencies might naturally arise. The normal instinct once acquired might be lost as a result of mental disease, or temporarily suppressed by preponderance of pathologic hyperexcitation of sexual desire. We should conclude, then, in any case of the higher degrees of incest, that there was a strong reason to investigate the mental condition of the culprit; but here, as in all cases where mental integrity is called in question, the proof of irresponsibility cannot be based upon an isolated act or mental symptom.

A minor sexual offense recognized by the law is **indecent exposure** or **sexual exhibition**. The law defines indecent exposure as such intentional exhibition of the naked human body or the private members as would shock the feeling of modesty or tend to corrupt morals. In common law the offense must be perpetrated in a public place and in the view of more than one person, but various statutes are of broader application.

Genital exposure is, in itself, where publicly committed, an act of most striking folly, marked by absence of all rational purpose. This fact makes the perpetrator of it a subject for mental investigation. Experience shows that exhibition is almost invariably dependent upon some mental anomaly, permanent or temporary. It may be done in intoxication, in satyriasis or nymphomania, in senile mental degeneration, or as an expression of sexual perversion.

The most disgusting forms of unnatural sexual offenses, while of comparatively infrequent occurrence, are yet medicolegally highly important; these include **pederasty**, **bestiality**, and the less important practice of **tribadism**. In English common law the term "sodomy" covers pederasty and bestiality, and is defined as carnal knowledge against the common order of nature, of man with man or woman, or of man or woman with a beast. Formerly, this unnatural crime was punishable with death; it is now punishable with ten years of penal servitude in England, but in the United States it is no more clearly defined than as an offense in common law. Penetration is essential to the legal definition of any form of sodomy. The evidence of an accomplice, if unsubstantiated, is not sufficient to prove guilt. Pederasty is legally defined as *immissio penis in anum*. Both parties to the act are, when voluntary and responsible participants, open to punishment. The offense may be committed by male with male or female. The male's part may be either active or passive; the female rôle is always passive.

The possibilities of this offense call for legal consideration similar to that required in the case of rape. One or the other or both of the parties to the act may, by reason of age or other disability, be legally irresponsible; the active party may accomplish his purpose by means of physical or moral force or fraud; the passive party may persuade an irresponsible active party to practice the vice.



Owing to the convincing evidence of physical signs, efforts have been made from the earliest times to establish certain conditions which are diagnostic of addiction to the vice. Tardieu thought that the practice of the vice made the glans penis pointed; constriction of the body of the penis at some distance from the glans was assumed to be the result of constricting pressure exerted by the sphincter ani. Such peculiarities are clearly the results of developmental defect, and they suffice to show that there are no diagnostic marks of the active practice of pederasty. Abrasions of the penis might arise from forcible attempts to pass it through the sphincter ani, but such accidental marks would have no independent diagnostic value.

Passive pederasty is capable of giving rise to more unequivocal physical signs of its practice. Forced *immissio penis in anum*, especially in the case of children, may well cause abrasions and tears of the mucous membrane of the anus, or even more serious and extensive lacerations, and consequent inflammation; but severe injuries are much more likely to have been induced by preparatory use of other means to accomplish the necessary degree of dilatation. A relaxed sphincter with obliteration of the centrally radiating folds that are characteristic of the normal condition has been interpreted as evidence of the passive practice of the vice; but such conditions are not unequivocal evidence, for they may be due to a great variety of causes. The same may be said of hypertrophic growths about the anus and of proctitis. Venereal disease may, of course, be communicated by pederasty; but when the anus or rectum is the seat of such affections, it is to be remembered that they may have arisen in other common ways. Demonstration of spermatozoa in the person of the passive party would be conclusive in some cases, but rarely so if the passive male party were beyond the age of puberty.

The degraded vice of bestiality cannot afford physical evidence of its practice. Animals made use of may show signs of the evil practice to which they have been subjected; demonstration of human spermatozoa in an animal would be conclusive proof. Almost any of the domestic animals may become a means of unnatural gratification.

The medicolegal importance of tribadism, or Lesbian love, is comparatively slight. In its fully developed form it consists of *immissio clitoridis in vaginam*, an act possible only when the organ is of unusual size and length—a condition that must be exceedingly rare. A female given to the active practice of the vice may have an enlarged clitoris, but such a peculiarity is no sign of such addiction. Those given to tribadism commonly resort to a minor vicious practice which might call for legal investigation—namely, genital kissing, or cunnilingus. This vice is practised as a part of tribadism, and is mainly of interest because it might be a form of genital abuse or seduction of children.

Reference has been made only to the physical aspect of the foregoing vicious habits; but their most important relation is that which they sustain to the mental state. Such unnatural offenses are in themselves sufficient to raise a question of the mental integrity of their

perpetrators, even though, in themselves, they are not a demonstration of irresponsibility. It is a sad commentary on humanity that the impulses of passion may induce a degree of degradation and depravity equalled only by the depth of moral degeneration due to mental defect or disease. This aspect of the unnatural offenses is discussed in more detail under the heading of Mental Perversions of the Sexual Instinct (Vol. I, page 663).

# MARRIAGE AND DIVORCE

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BISHOP defines marriage as "the civil status of one man and one woman united in law for life for the discharge to each other and the community of the duties legally incumbent on those whose association is founded on the distinction of sex." Stewart says that "A legal marriage is the union of a man and woman in the lawful relation of husband and wife, whereby they can cohabit and rear legitimate children." According to an earlier definition, "Marriage is a contract having its origin in the law of nature antecedent to all civil institutions, but adopted by political society and charged thereby with various civil obligations. It is founded on mutual consent, which is the essence of all contracts, and is entered into by two persons of different sexes, with the view to their mutual comfort and support, and for the procreation of children."

Broadly stated, the object of the state in interfering with the marital relation when once established is the protection of the family and the preservation and improvement of the species. It is only within the last few years that any extended effort has been made by legislators to regulate marriage, the law heretofore having generally concerned itself only with those questions arising *after* the marriage has occurred. As early as 1905, however, a number of states enacted so-called "eugenic" laws, Minnesota, Delaware, Michigan, Connecticut, New Jersey, and North Dakota placing such laws upon their statute books; Indiana also passing one providing for sterilization "to prevent procreation of confirmed criminals, idiots, imbeciles, and rapists" (Laws of Indiana, March 6, 1905). None of these laws have proved very efficient, however, and the measures aimed at the sterilization of the unfit have especially met with great opposition. In 1913 Wisconsin enacted legislation requiring medical certificates from all persons applying for marriage licenses, showing that the applicants were free from venereal disease. Ohio, Washington, and some other states now have laws requiring health certificates from those about to marry. Connecticut and Minnesota have laws forbidding the intermarriage of persons who fall within certain classes, but the laws of neither state include persons afflicted with pulmonary tuberculosis or venereal disease. "None of these laws has proved satisfactory or efficient, and does not furnish the remedy for the evil" (Jour. Amer. Med. Assoc., Editorial, May 17, 1913, 60, 1562). In 1919 thirteen states—namely, Alabama, Indiana, Michigan, New Jersey, New York, North Dakota, Oregon,



Pennsylvania, Utah, Vermont, Virginia, Washington, and Wisconsin—had laws in force relating to venereal disease in connection with marriage. The laws vary in wording, but the purport of all is to prevent the marriage of all afflicted with acute syphilis or gonorrhea. In North Dakota, Oregon, and Washington the restrictions apply only to males. Indiana and Pennsylvania disqualify for marriage persons afflicted with “any transmissible disease,” but only four states—Alabama, North Dakota, Oregon, and Wisconsin—require that freedom from the specified physical disabilities shall be established by physician’s certificate. The Wisconsin law is the most inclusive and specific. Any person who has been afflicted with gonorrhea or syphilis must file a certificate from a designated state laboratory, showing that such person has been examined and is not in a communicable state of the disease.

The proper enforcement of these laws rests almost wholly in the hands of the medical profession. How easily it may be avoided by the aid of a negligent or dishonest medical examiner is illustrated by a case occurring in Milwaukee, where an individual, under the name of Ralph Kirwinio, was certified by a physician to be free from venereal disease, obtained a license and was married to a young woman, who shortly thereafter complained that “Ralph” had proved to be a woman named Cora Anderson, masquerading in male attire.<sup>1</sup>

Not only do great international differences in the law of marriage exist, but in the United States each state is, as to marriage legislation, independent and sovereign; the jurisdiction of the Federal Government as to marriage extending only over the territories and our consulates. The conflict of law as to marriage and divorce has reached an almost scandalous notoriety. There is, perhaps, only one general rule that can appropriately be noticed here; this is, that a marriage, if valid where it is made, is also valid and will be recognized as such everywhere else. No such difference exists in any other class of legislation as that regarding divorce, the grounds of which, if strictly proved, may be a cause only for a separation—*i. e.*, limited divorce—in one state or country, while in another jurisdiction exactly the same grounds may be liberally admitted, and, on slight evidence, as reason for total divorce. In some states a ground for avoiding the marriage *ab initio* is given under the causes for divorce, and annulment is also looked on as a species of divorce. There are, perhaps, no two states that agree as to what facts of residence, etc., will give jurisdiction in divorce proceedings. In some the distinction between a void and a voidable marriage may be discovered rather by reference to precedent than to statute; and there is a real necessity that all these distinctions be recognized, for upon them may depend such important matters as the legitimacy of children and the right of dower.

To illustrate the difference between void and voidable marriage let it be supposed that, in a given state a bigamous “marriage” is *ipso facto* void *ab initio* without decree to that effect, and has been so determined, perhaps, in a purely collateral proceeding. The issue of

<sup>1</sup> “Eugenic” marriage laws, B. C. Roloff, Social Hygiene, 1920, 6, 227.

such bigamous relation will, in the absence of statute providing for such a case, be illegitimate, and neither dower nor courtesy will arise from it. But if one of the parties to a marriage enter into the relation incurably insane, such marriage is, nevertheless, generally valid until declared void by a competent court; and unless it is so declared, all the incidents of marriage and the legitimacy of children will arise the same as in a perfectly valid marriage. This is often the case in states where certain marriages are forbidden as "void." But if a decree totally avoiding the marriage is obtained, the result is, in general, the same as if the marriage were void *ab initio*. In the absence of statutes protecting innocent offspring of such marriage, the latter will be illegitimate. No two states agree as to what marriages are void and what are voidable, but it may be said in general that the innocent offspring of such marriages are made legitimate by statute.

The laws of marriage in the several states originate from the law on that subject as it existed in England at the time of the adoption of the Federal Constitution, as subsequently modified by state legislation and local judicial interpretation. The law of divorce as it exists in the several states is entirely of local creation (Ringrose). Alabama, Arizona, California, Delaware, Georgia, Idaho, Kentucky, Maryland, Mississippi, Missouri, North Carolina, Oregon, South Carolina, Tennessee, Texas, and Utah forbid the marriage of whites with negroes or Mongolians, but in certain states medical opinion may be required to determine whether a given individual shall be classed as a negro or Mongolian.

Insanity, either pre-existent to the marriage or arising after marriage, is a ground for annulment in several states. Idaho, Mississippi, Pennsylvania, Utah, and Washington give absolute divorce upon proof of permanent insanity of one party to a marriage. Texas, New Jersey, and the Philippines do not admit insanity as a cause for divorce. In the state of New York legal separation may be granted when the defendant's conduct is such as to render cohabitation unsafe and improper. This provision, of course, includes insanity.<sup>1</sup> The Court of Chancery of New Jersey recently refused to annul a marriage where the wife alleged antenuptial fraud, because the husband had concealed from her the fact that he believed himself "tainted" by hereditary insanity, and did become incurably insane six years after marriage; the Court ruled that the possibility of insanity was not a disease of such a nature to render contact seriously dangerous to the other party to the marriage, or pregnancy dangerous to the wife.<sup>2</sup>

A directly opposite ruling was made in New York in a case where the wife before marriage concealed from the husband the fact that she had been a patient in an insane hospital, and that a brother and sister had also been under treatment for mental disease, the sister being then in confinement because of insanity. On the wife's becoming permanently insane the husband applied for annulment, which was granted

<sup>1</sup> Insanity and Divorce, A. Gordon, N. Y. Med. Jour., November 21, 1914, 100, 997.

<sup>2</sup> Allen vs. Allen (N. J.) 95 Atl. R. 363.

to him on the ground of the marriage having been procured by fraud on the part of the wife and her relations.<sup>1</sup>

Thirty-eight states have some law restricting the marriage of idiots and insane persons, and in several of these—Connecticut, Indiana, Kansas, Minnesota, New Jersey, North Dakota, Ohio, Pennsylvania, Utah, and Wisconsin—epilepsy is also specified as a bar to marriage.

If one party to a marriage has concealed the fact that he or she is afflicted with epilepsy, this may be adjudged a reason for annulment in a number of states, and in some—Wisconsin, for instance—it is an impediment to marriage aside from any question of fraud or concealment. Medical evidence on this question may be important, as in a case where the husband alleged that the wife had before marriage concealed from him the fact that she was subject to epileptic seizures, that marital relations induced the attacks so that coitus was abhorrent to her, and that, as epilepsy can be inherited, he was likely to become the parent of an epileptic offspring. The court ruled, however, that as coitus was possible, and medical authority placed the inheritance of epilepsy at only 16 per cent., that there was insufficient ground for annulment.<sup>2</sup>

The Supreme Court of Minnesota also denied a similar petition on the ground that the legislature had not prescribed epilepsy as a ground for annulment of marriage, and the courts of the state had never recognized that disease as a cause for nullifying the marriage contract.<sup>3</sup>

An opposite opinion was held in New York where a husband was adjudged induced to marry by fraud, in that the wife and her relations and family physician had all assured him before the marriage that she did not have epilepsy, whereas she was subsequently proved to have been subject to epileptic seizures from childhood. The marriage was annulled.<sup>4</sup> A curious case is reported from Wisconsin where a man subject to epilepsy went from that state to Minnesota, was there married, and returned at once to live in Wisconsin. The object of having the marriage performed in Minnesota was to avoid compliance with the "eugenic laws" of Wisconsin, but thereafter the relatives of the man discovered that the marriage of epileptics is forbidden by the Minnesota laws, and opposed the petition of the wife to the Wisconsin court to have her marriage confirmed in that state. The court found that though at the time of the marriage the Wisconsin law did not expressly prohibit the marriage of epileptics, it had that intent; and, moreover, a marriage void in Minnesota was also void in Wisconsin.<sup>5</sup> While such questions are more directly the concern of lawyers rather than of physicians, the existence of such legislation frequently makes it necessary to call in the aid of the medical profession to pass on the physical and mental state of a person supposedly epileptic.

Although tuberculosis is not specifically mentioned as a bar to marriage in most state laws, it has been admitted as a cause for separa-

<sup>1</sup> *Smith vs. Smith* (N. Y.), 184 N. Y., Supp. 134.

<sup>2</sup> *Elser vs. Elser* (N. Y.), 160 N. Y., Supp. 724.

<sup>3</sup> *Behsman vs. Behsman* (Minn.), 174 N. W., R. 611.

<sup>4</sup> *McGill vs. McGill* (N. Y.), 163 Supp., 462.

<sup>5</sup> *Kitzman vs. Kitman et. al.* (Wis.), 1166 N. W., R. 789.



tion and annulment in many courts. In New Jersey the Court of Chancery ruled that the suppression by one party to the marriage of the fact that he is suffering from a disease which renders the close intimacy of the marriage relation dangerous, and may result in the transmission of the disease to offspring, constitutes a fraud sufficient to give ground for annulment of the marriage. The court "could not agree that the only diseases which effect an essential of the marriage relation are those of a venereal nature. Neither good morals nor public policy are subserved by compelling parties to live together with the ever-present danger of infection, and beget offspring likely to be tubercularly inclined." Nor was there in this case "any essential difference between syphilis and tuberculosis."<sup>1</sup>

In New York decisions concerning tuberculosis antecedent to marriage appear to rest entirely upon whether it can be proved that the defendant spouse wilfully concealed the fact that he or she was afflicted with the disease, such concealment constituting a fraud. Medical evidence is necessary to establish the prenuptial existence of the disease in order to give ground for annulment of marriage.<sup>2</sup> In one case, however, the court ruled that the plaintiff had not produced sufficient competent medical testimony to prove that the defendant husband really was tubercular; and, moreover, that her demands for alimony indicated that she had had opportunity before marriage to ascertain the defendant's earning capacity, which would presuppose a similar opportunity to inquire into the state of his health. Her petition for annulment was therefore denied.<sup>3</sup>

In suits concerning breach of promise to marry the question of disease is occasionally brought up, so that medical evidence becomes necessary. In Iowa a woman was awarded damages from the estate of one Oldfield, because he had broken his engagement to the plaintiff on the ground that he was afflicted with pernicious anemia, an incurable disease, and had but a short time to live. This judgment was reversed by the Supreme Court, which held that the medical testimony regarding Oldfield's condition and subsequent death justified the breaking of the engagement and took away any ground for damages.<sup>4</sup>

The Supreme Court of Washington also reversed a judgment where a woman who had developed a "floating kidney" during her engagement to the defendant, and being thereby debarred from safely entering into the marriage relation, had received damages for breach of promise to marry. The decision was that the defendant had agreed to marry a healthy woman, and that when medical evidence showed her to be physically unfitted to assume the functions of a wife and mother he was justified in withdrawing from the engagement.<sup>5</sup>

The New York statute, among others, may be referred to as affording a logical classification of matrimonial actions. It provides for three

<sup>1</sup> *Davis vs. Davis* (N. J.), 106 At., R. 644.

<sup>2</sup> *Sobel vs. Sobel*, Public Health Reports New York, November, 1914.

<sup>3</sup> *Abramowitz vs. Abramowitz* (N. Y.), 140 N. Y., Supp. 275.

<sup>4</sup> *Parsons vs. Trowbridge* (U. S.) Court, 226 Fed., R. 15.

<sup>5</sup> *Travis vs. Schnebly* (Wash.), 122 Pac., R. 316.

forms of such suits: first, an action to annul a void or voidable marriage; second, an action for divorce; third, an action for separation. All the grounds for such suits are set forth in the following sections from the New York statutes:

1742. *Action by a Woman, Married Under Sixteen, to Annul Marriage.*—An action may be maintained by the woman to procure a judgment declaring a marriage contract void, and to annul the marriage under the following circumstances:

1. Where the plaintiff had not attained the age of sixteen years at the time of marriage.
2. Where the marriage took place without the consent of the father, mother, guardian, or other person in legal charge.
3. Where it was not followed by consummation or cohabitation, and was not ratified by any mutual assent of parties after the plaintiff has attained the age of sixteen.

1743. Action may also be maintained to procure judgment declaring the marriage contract void, and to annul the marriage for either of the following causes existing at the time of the marriage:

1. One or both of the parties had not attained the age of legal consent.
2. That the former husband or wife of one party was living, and that the marriage with the former husband or wife was then in force.
3. That one of the parties was an idiot or lunatic.
4. That the consent of one of the parties was obtained by force, duress, or fraud.
5. That one of the parties was physically incapable of entering into the marriage contract.

But an action can be maintained under this subdivision *only* where the *incapacity* continues and is incurable.

1752. An action to annul marriage on the ground that one of the parties was physically incapable of entering into the marriage state may be maintained by the injured party against the party whose incapacity is alleged; or such an action may be maintained by the party who is incapable against the other party; provided, the incapable party was unaware of the incapacity at the time of marriage, or, if aware of such incapacity, did not know it was incurable. Such action must be commenced before five years have expired since the marriage.

Adultery has been the only ground for divorce up to the year 1922, when six years' absence unheard from, the so-called "Enoch Arden law," was made a cause for absolute divorce.

*A legal separation may be decreed for the following causes:* 1. The cruel and inhuman treatment of the plaintiff by the defendant. 2. Such conduct on part of defendant to plaintiff as may render it unsafe and improper for the former to cohabit with the latter. 3. Abandonment of the plaintiff by the defendant. 4. Where the wife is plaintiff, the neglect or refusal of the defendant to provide.

The grounds for all sorts of matrimonial actions throughout the states are adultery, impotence, mental incapacity at time of marriage,

mental incapacity during marriage, bigamy, abandonment, disappearance, cruelty, habitual drunkenness, antenuptial unchastity, lack of support, imprisonment for crime, conviction of felony, concealed antenuptial pregnancy not caused by husband, lack of age and consent, and loathsome disease. In some states practically any one of these grounds is sufficient for a total severing of the marital relation, either by a total divorce or by a nullity suit. In others, only a separation *a mensa et thoro* is granted for the less grave of the causes enumerated. In some of the states certain of the above grounds are legal basis for any suit, and each state differs from the others as to the causes for the different classes of action as well as to the jurisdictional facts, such as residence. In South Carolina a divorce cannot be obtained for any cause.

The states differ also as to the defenses to these actions. Some of these defenses are recrimination (counter-accusations), condonation (conditional forgiveness), collusion, connivance, and lack of volition. Cruelty in some states is allowed as a recrimination to adultery. The same evidence that is used to prove adultery is sometimes applicable and is used to prove illegitimacy. Such circumstantial evidence of inclination and opportunity which forces the irresistible conviction on the mind that adultery has been committed is admissible and sufficient proof of the latter. In general, the weight of evidence as in the civil cases is sufficient. As the state is interested in sustaining the marriage, the plaintiff's case must be proved in default cases, and in some jurisdictions a public officer acts in the state's interest on behalf of the absent defendant.

The only sexual crimes that are necessarily against marriage are adultery and bigamy. Incest, rape, seduction, and unnatural crimes are sexual crimes that may or may not be involved in offenses against the marriage relation.

**Adultery** is the voluntary sexual intercourse of a married person with one not the husband or wife. The definition of adultery considered as a crime is by no means uniform throughout the states.

**Bigamy** is committed by any person who, being married, shall marry any other person during the life of the former husband or wife, unless legally divorced therefrom.

**Cruelty** is such conduct in one of the married parties as renders cohabitation physically unsafe to a degree justifying a withdrawal therefrom.

On account of the technicalities connected with marital suits, and of the variance, already referred to, in the law of different jurisdictions, the above sketch of the more purely legal side of the subject of marriage and divorce is necessarily crude.

## MEDICOLEGAL QUESTIONS

The principal issues arising under the head of marriage and divorce in which law calls upon medicine are those involving questions of



mental and physical capacity, cruelty, venereal disease, pregnancy, and the existence of sexual intercourse.

**Impotence, Physical Incapacity.**—This may be a ground either for separation, divorce, or annulment, according to the jurisdiction. It must date from the inception of the marital relation. It is apparent that this is peculiarly a matter of medical evidence.

While the lack of physical capacity to consummate marriage is sometimes called cause for divorce this term is really a misnomer, for decrees based on this ground are really decrees of nullification.

Strictly speaking, impotence means the want of procreative power in one of the contracting parties, whether arising from a faulty condition of the external or internal organs of generation, or from any moral or physical cause.<sup>1</sup> But from a legal standpoint, as an impediment to marriage or as a cause for its annulment, the defect must be relative to the capability of proper copulation rather than mere inability to procreate.

At the outset some of the presumptions in these cases may be noticed. The power to consummate the marriage is presumed. The refusal of the copula from the date of marriage is *prima facie* evidence of impotence; yet in some jurisdictions is not evidence of desertion. Again, the physical consummation of marriage is more strongly presumed when there has been access of the husband; sleeping in the same bed or in the same room is stronger evidence, raising stronger presumption, than merely sleeping in the same house or apartment. In any case of alleged impotence the refusal to accept reasonable and proper means of cure is a conclusive presumption. Very delicate questions arise as to what means may be refused. What kind of impotence is it for which the law affords relief? It is not the failure to ejaculate, nor the failure to fecundate either the party to the suit or in general; nor the failure to be fecundated by the party in suit or in general, but the impossibility of the proper performance of the act of copulation between the parties to the suit. The power of either of the spouses to have copula with another than his or her marital partner is a totally irrelevant consideration.

It is not *impotentia seminalis*, but *impotentia copulandi* only in the individual case that constitutes legal impotence.<sup>2</sup> The English law does not recognize sterility without impotence. The law seems in this instance to take no note of the propagation of the race as one of the objects of matrimony, but rather of the gratification of desire.<sup>3</sup> The difficulty of proving that copulation could take place without fecundation has much to do with this result, and so the rule is subject to certain exceptions. In the event of castration or complete bilateral ovariectomy it is possible that the impossibility of fecundation would become relevant; and that the patent impossibility of parentage,

<sup>1</sup> Wharton and Stillé, Medical Jurisprudence.

<sup>2</sup> Dean *vs.* Aveling, 1 Rob. Ecc., 279.

<sup>3</sup> Not that gratification of desire is the exact expression of this object, since there may be successful intercourse without such gratification on both sides.

one of the chief objects of marriage, would be taken into account. On the other hand, there might be an exception in the case of *impotentia copulandi* combined with *potentia seminalis*, where the wife submits to artificial impregnation. Here the propagation of the race would have been effected and the law would not interfere, on the ground that the parties, or either of them, could not gratify their desires, or more strictly expressed have intercourse successfully. In some European codes a proved sterility of both spouses affects their right to adopt a child; and this sterility is conclusively presumed after both are over fifty years of age, the marriage being childless.

Physical incapacity may be due to psychic causes, yet must not be a mere mental incompatibility. This seems somewhat paradoxical, and, in fact, may involve very difficult considerations. In one case the spouses may have made a *bona fide* attempt to consummate the marriage physically and may have failed, yet so far as the best observation can note, no physical obstacle exists. In the other case, repugnance to the sexual act may prevent fair attempt at intercourse.

\* The impotence must be unknown to the plaintiff at the time the marriage was contracted. Unless it is a patent case some time must be allowed to establish a presumption of its existence. And, again, too great a time must not elapse, nor plaintiff sleep on his or her rights, nor refuse means of cure, as already stated. Ratification of the contract and waiver of grounds for avoiding it will be presumed from the *laches* of a party, as in other contracts.

An impossibility of *potentia copulandi* in a proper manner may arise from many causes—the presence of a loathsome disease, for instance. Mere age or merely having passed the menopause does not establish a good cause, as a rule. These facts must necessarily have been known or reasonably expected before marriage; besides, in neither case is there necessarily an *impotentia copulandi*. Again, there may be such a variety of hermaphroditism among its many varieties as to prevent proper copula.

In cases where the sex of an individual is in doubt fluoroscopic or *x-ray* examination, or in some cases laparotomy will be necessary to decide the question. The laws now in force are generally in agreement that sex is decided by the *internal* organs of generation. An individual possessing a uterus and adnexa is a female no matter what the appearance of the external genitals, or the secondary sex characteristics; and if the presence of a single testicle can be demonstrated the individual possessing it is a male, even if all the external appearances are distinctly feminine.

As pseudohermaphroditism is now usually observed before or at the time of puberty it is seldom brought forward as a cause for divorce.

In the husband the causes of *impotentia copulandi* may be, in addition to the ordinary cause of a flaccid organ impossible of erection, the shortness or amputation of the penis; the non-descension, congenital absence, or disease of the testicles; disease of the penis; large obstructions from hydrocele or hernia.

As to the natural or artificial shortness of the penis emission may be perfect in such a case, and yet fecundation may not result. Under such circumstances as have been previously stated no remedy is given the wife, although the conditions may be so exaggerated that no copula, in the proper sense of the word, can take place. If there is no such impregnation, then in the case under consideration the question arises as to whether the degree of penetration that is possessed by the husband is such that the wife should be satisfied and not be permitted to avoid the marriage. In some of these cases it is patent that the sexual embrace is a mockery so far as the wife is concerned, although there may be erection and enjoyment on the part of the husband.

The non-descent of the testicles does not necessarily imply impotence; nor in case of castration is *potentia copulandi* impossible. Yet it is a question whether a husband could successfully defend a suit if such ground existed. The claim that *potentia seminalis* can exist in castration may be passed over without comment. As to what disease of the testicles exists, and whether the extent to which they are diseased constitutes impotence, only a consideration of each individual can establish. The ordinary cases of impotence due to sexual exhaustion, perversion, masturbation, excess, overwrought desires, hypochondriasis, absence of desire, preoccupation, and other psychic causes may be cured. Absence of power of erection, and of consequent intromission is the only form that constitutes legal impotence.<sup>1</sup> The plaintiff (wife) has a right to demand as an alternative either that the defendant (husband) attempt the cure, or, if he refuses this, the remedy given in the jurisdiction for impotence.

In the wife, impotence may be due to absence or restricted depth<sup>2</sup> of the vagina, such a case of absence of the uterus as makes the copulation incomplete,<sup>3</sup> a thick, firm hymen, atresia vaginæ, extreme displacement of the uterus, inflamed condition of the mucous lining, abnormal quantity or quality of the secretion, extreme sensitiveness of the organs (vaginismus), elongated clitoris, fibromata or other neoplasms, exaggerated nymphæ, and other malformations. Some of the above obstacles may be cured. The courts expect a submission to reasonable and not degrading remedies, experiments, or operation; or the same alternative as in the case of the husband noted above. An elongated clitoris may be amputated, and the hymen perforated; even a pseudovagina may be made by surgery. The operations have one aim—the possibility of copula.

In the event of impregnation, however, there is a legally conclusive presumption of sexual potency; this is so even though the hymen may be but slightly perforate, and without regard to malformations that may exist in whatever degree. In case of a known absence of the essential sexual organs except the vagina (complete ovariectomy or hysterectomy) the court might give relief on the sole ground of barren-

<sup>1</sup> See Cooper, A., *The Sexual Disabilities of Man*, 4th ed., 1920.

<sup>2</sup> *G. vs. G.*, 33 Md., 301.

<sup>3</sup> *Dene vs. Aveling*, 1 Rob., 274.



ness in spite of the *potentia copulandi*, although no case of this sort has come under the writers' notice. On the other hand, certainly no amount of proof of barrenness will affect the marital status of the wife.<sup>1</sup>

All that a husband has to prove in alleging the wife's impotence is, not a general incapacity, but her incapability to receive his embrace properly. Both her general capacity and incapacity are immaterial. As with the husband, so with the wife; not only coition, but a proper coition is expected without need to resort to indelicate remedies. The same provision as to waiver and ratification obtains here as in the case already mentioned.

With reference both to husband and wife, the foregoing will show what care is necessary to be exercised in the use of the terms sterility, impotence, absence of desire, and barrenness.

A recent writer<sup>2</sup> has asserted that "Half the sterile marriages are due to azoöspemia of the male as the result of gonorrhea, and at least 90 per cent. of the other half due to the female inability to procreate, is also caused by the infection the wife has received from her husband." Operations for the relief of male sterility have been attended with considerable success, so that it is no longer possible for the entire responsibility for a childless marriage to be placed upon the wife.<sup>3</sup> Any physician who is asked to look for the cause of sterility should give both husband and wife a thorough examination, including microscopic examination of the seminal fluid to ascertain the presence of live spermatozoa.

In studying and reporting on physical incapability, the following are guiding questions: Is the physical peculiarity in this case of one spouse as regards the other spouse at present a total (1-2) or a partial impediment (3-4)? Is it curable or incurable (5-6)? Is it discoverable by inspection or by expert inspection, or by further experiment of cohabitation between the parties alone? Theoretically, the complaining party is sexually potent. Thus, in the old pleading, the wife as complainant alleges she is "*virgo apta and intacta*." But the burden of proof always rests upon the complainant.<sup>4</sup>

**Mental Incapacity (Insanity).**—An insane person, or one so deranged as not to understand the ordinary affairs of life, is incompetent to marry. Without mental capacity to give the consent necessary to a valid contract there can be no marriage. The party must be insane at the time of the ceremony or contract in order to render the marriage void, otherwise it will be held valid. If the mental incapacity were only temporary, and if the person consent to the union during subse-

<sup>1</sup> Among the Israelites and Romans the idea of shame and disgrace went with sterility, and the latter was sufficient for the dissolution of the marriage relation. The Christian idea of marriage, as being a relation entered into for more ideal purposes, has ameliorated these opinions of sterile marriages and has taken away their severe consequences.

<sup>2</sup> Talmey, B. S., Frigidity and sterility in the female, *Medical Record*, October 8, 1921, 100, 631.

<sup>3</sup> McKenna, C. M., Short circuit of the vas deferens, *Surg. Clin. Chicago*, February, 1919, 3, No. 1, p. 145. Bernhart, W. F., Epididymis-vas anastomosis for sterility, *N. Y. Med. Jour.*, October 25, 1915, 102, 848.

<sup>4</sup> 93 III, 373.

quent lucid intervals, the marriage will be confirmed and valid.<sup>1</sup> It hardly seems necessary to add that the degree of insanity to render a marriage void must be such as to render the party incapable of understanding the meaning of the act; it must be more than mere weakness of intellect or natural eccentricity. The consent of a person who is markedly under the influence of liquor is good and binding, unless the degree of intoxication is sufficient to cause complete unconsciousness or *mania a potu*, or the drunkenness has been produced for the purpose of obtaining consent. Cases of incapacity in matrimonial actions are often, in fact, confused with and hard to distinguish from cases of fraud, mental duress, mental weakness due to age, sickness, or drugs, and particularly undue influence. All these equally may be causes for such suits. A clear line, however, should be drawn between cases of pure incapacity and those cases in which the will and intentions of a party to the marriage contract, normally competent, although perhaps barely so, are overcome by force of the superior personality or will of another person with or without various assisting circumstances. The connection of duress with hypnotic control should be referred to in this connection as a subject that has developed through numerous experiments of experts in this interesting field.

A case illustrating some of the points just considered was reported from the state of Washington in 1914.<sup>2</sup> A physician who had been in the habit of taking drugs, because of insomnia, was in great anxiety over the severe illness of his mother to whom he was much attached. During this period of mental stress he came under the influence of a nurse whom he had known only slightly before, who induced him to go at night to a sanitarium which she maintained where she gave him drugs and hot baths as she claimed to induce sleep. During this period the woman claimed they became engaged, although the physician had no recollection of either courtship or engagement. After keeping him under her control for a week, they applied for a marriage license, which the auditor, at the suggestion of the plaintiff's friends, refused to issue. In the afternoon they met at the home of his pastor, where the plaintiff was examined by two physicians, who agreed that he was not then mentally competent to enter into the marriage relation, owing to excessive use of drugs.

But despite the advice of the physicians, the advice and protests of the pastor, and the earnest protest of the plaintiff's relatives, they procured a license at 11.30 that night and were married at midnight. They lived together at the sanitarium conducted by the defendant for eight days, when the plaintiff left the defendant and brought action to annul the marriage. The court ruled that the plaintiff was mentally incompetent at the time of the marriage, and that the marriage was not validated by consummation or ratification.

In a matrimonial suit founded on mental incapacity a previous adjudication of insanity, under either a writ of *de lunatico inquirendo*

<sup>1</sup> Hag. Ecc., 355; 28 Ala., 565; 23 Miss., 410.

<sup>2</sup> *Waughop vs. Waughop* (Wash.), 143 Pac., R. 444.

or otherwise, constitutes merely a rebuttable presumption.<sup>1</sup> Although mental incapacity, in all the types known to the nervous specialists, may be cause for the relief already indicated, whether due to disease or defect; whether temporarily manifested or artificially produced; or whether the will has been cheated or overcome by another will, still there remains the question, What form, what degree, of these general causes is required in such cases?

In analogy with cases affecting other contracts, wills, or questions of intent of a defendant at the criminal bar, the capacity required for contract by the marital relations must be the capacity to know the nature and consequences of the act done.<sup>2</sup> This capacity, therefore, must be *quod hoc*—*i. e.*, marriage. A marriage by one *non compos*, in order to be annulled or given the relief of the special jurisdiction, must be such as to affect the contract. That which would disqualify a person from entering into property relations might not reach his capacity to contract a marriage.<sup>3</sup> The law, therefore, does not deem a marriage contracted during a "lucid interval" as a subject for its interference. In general no relief can be obtained for attacks of insanity before, followed by permanent insanity after, marriage. Persons afflicted with monomania, pyromania, kleptomania, or dipsomania may not be in any legal manner unfit to make the marriage contract.

Intoxication might well legally incapacitate a person from contracting marriage at the same time that he was alive to ordinary property relations. The artificial means of producing mental incapacity are chloral, opium, and its alkaloids, cocain, heroin, hasheesh (*cannabis Indica*), ether, and nitrous oxid. These agencies also figure in cases of unconscious adultery; the case of sexual relations, real and imaginary, resulting from the administration of nitrous oxid are quite curious. In a case where it is clearly proved that the defendant was insane at the time of the commission of adultery, no legal adultery can be made out, intent being absent.

With regard to undue influence we may well quote Wharton and Stillé, vol. i, p. 13: "Undue influence is not merely mental debility; it is the latter, plus the active, interference of another—*i. e.*, it is not subjective but objective. Mental debility alone would not suffice. For it is conceivable that a person weak-minded to a certain degree might contract a lawful marriage, knowing the incidents of such well enough, yet a marriage of the same person in a case where another's will was imposed upon him by force of any association, suggestion, or fraudulent ingredient, not amounting alone to fraud, would be voidable."<sup>4</sup>

**Duress.**—A compulsory marriage is illegal unless afterward confirmed by the acts of the parties.<sup>5</sup> A man or woman forced into the

<sup>1</sup> *Banker vs. Banker*, 63 N. Y., 409, 1 Hag. Con., 416.

<sup>2</sup> 52 Me., 505; 44 Nft., 531; 14 Bob., 488; 24 Wend., 85; 1 Houst., 308 (Delaware); 55 Me., 256; 4 Con., 217; 21 Wend., 142.

<sup>3</sup> *True vs. Ramey*, 1 Post., 4.

<sup>4</sup> Undue influence; *Perkins vs. Scott*, 23 Iowa, 237; *Portsmouth vs. Portsmouth*, 1 Hag. Ecc., 355.

<sup>5</sup> 6 Baxt., 297.



relationship from fear of bodily harm is not legally married unless he or she afterward acquiesces by *voluntary* sexual intercourse or by expressed words.

In urging condonation against a wife who is plaintiff in a divorce suit, duress of the husband, that was formerly so frequently implied by law, is still considered. Thus, condonation is less readily proved of the wife than of the husband, owing to the usual relations between the sexes from a financial, social, and general historic standpoint. Of course an insane person cannot condone.

**Other Questions.—Cruelty.**—The evidence of actual cruelty is the same as that of ordinary assault cases, as to marks of violence, etc., treated elsewhere. But in matrimonial actions—cruelty being a cause for divorce in some jurisdictions, and for a separation in others—there are in addition, many and differing interpretations of the term cruelty. Thus under this head, are fear and mental cruelty. Further, cruelty is a relative term, "*versus hauc*," so that the circumstances of each case are separately considered with relation to the relative power of inflicting, and susceptibility to, either physical or mental torture.<sup>1</sup> Again, in jurisdictions where sodomy or sexual perversion generally is not a cause of divorce, it may constitute "cruelty" or cause for separation.

In Arkansas, "indignities which render coition and cohabitation intolerable" give ground for absolute divorce; in Missouri, "intolerable indignities"; in Oregon and Pennsylvania, "personal indignities rendering life burdensome" are sufficient cause for severing the marriage bond. In Vermont a cause for divorce is the "intolerable severity of either party." A Wisconsin wife may be freed from her husband if his conduct is "such as to render it unsafe and improper for her to live with him." These laws admit of a wide latitude of interpretation, and medical opinion is often sought to decide questions arising in this connection.

Both refusal of the sexual embrace and the infliction of excessive intercourse have been held to be cruelty. A venereal disease communicated to the plaintiff by the defendant has been so considered. Profanity, various kinds, degrees, and amounts of abuse, either with or without threats, have been held cruelty: whether produced by insanity or disease, it is cruelty; the innocent spouse need not suffer it. The question of *intent* not being considered, it does not avail the defendant to show his cruelty to be due to temper and not to malice. Florida gives divorce for habitual indulgence in violent and ungovernable temper. The health, temperament, and mental condition of the plaintiff being of such importance, the physician and nerve-specialist have an ample field in these cases, and are actually employed largely on them.

In cases of mental cruelty the real theory is that the mental condition has had, or would have had, an indirect effect on the physical.

Evidences as to unchastity, of unnatural practices, of venereal dis-

<sup>1</sup> No law of averages, of the normal effect of the conduct complained of, on a normal person is considered.

ease, of pregnancy, of rape, of copula, are the same, as far as the questions born on marital questions, as in the other connections elsewhere discussed.

Pregnancy of the wife at the time of marriage, *unknown* to the husband, is a divorce cause in Georgia, Kentucky, Mississippi, Missouri, New Mexico, North Carolina, Oklahoma, Tennessee, Virginia, West Virginia, and Wisconsin. In Iowa if the husband have an illegitimate child or children, then living, the existence of whom was unknown to the wife at the time the marriage took place, he has no ground for divorce even if the wife's pregnancy by another man at the time of the marriage can be proved.

**Venereal Disease.**—This may be the basis of a charge of cruelty, and may be evidence of adultery if fastened upon the guilty party too long a time after the beginning of the marriage to be the result of intercourse before marriage.

**Access, Birth of Child** (as stated elsewhere more fully under Birth and Legitimacy).—A child who could have been born within a legal time after access is presumed to be the child of the husband; but if without such time is illegitimate, and is proof positive of adultery and a cause for divorce.

**Unchastity.**—Concealed antenuptial unchastity, unless pregnancy result and exist at marriage, is almost without exception insufficient cause for annulment. The rule here on public grounds is, *caveat emptor*. Having been, unknown to husband, a prostitute before marriage is a ground, however, in some jurisdictions, as in Virginia and West Virginia.

In Maryland a divorce is obtainable when the woman before marriage has been guilty of "illicit carnal intercourse with another man, the same being unknown to her husband at the time of the marriage."

**Access.**—In general this equals cohabitation in contemplation of law. To all intents and purposes they are synonyms. This is particularly important in questions of condonation. The presumption is but slightly stronger in a case where spouses stay all night in a room where there is but one bed, than in such a well-contrasted case where they are merely alone for a few minutes in the same room by day, or have privacy for a short time in a separate domicile (private house or apartment), using a suite of rooms and servants being in such domicile.

**Miscegenation.**—Before leaving the topic of marriage and divorce, the subject of miscegenation should not be omitted. In several of the states, as already stated, marriages between white persons and negroes or Indians are strictly forbidden under penalty, the marriage being void or voidable according to the jurisdiction. The ground for this legislation is the public health. It is based upon physiologic facts and theories, and the general belief that the natural law of selection, "each after its own kind," applies to races of men as it does to animals. Hybrid or cross-breeds are regarded as inferior to the pure blood of either race. A famous southern Methodist bishop (colored), however, shows, by appeal to facts and figures, that the African race on this continent is becoming rapidly absorbed by and into the Caucasian or

white race by irregular unions without any appreciable deterioration. From this it appears that the apprehension of demoralization, etc., is not well founded so far as miscegenation between negroes and whites is concerned. Still, where such prohibition is in vogue, there should be a severe penalty for those persons who deliberately and illegally form a union to bring into the world children whom they know can never become legitimate. The innocent little sufferers of such marriages are chiefly to be considered, and the law aims at prevention by inflicting heavy penalties; while by merely declaring the marriage void, the greatest punishment falls directly upon the children and not upon the parties themselves.

**Mental Incapacity.**—This is sometimes a ground for matrimonial actions, annulment, divorce, or separation, according to the jurisdiction, as has been noted, and is also a defense to civil and criminal charges of adultery. As a cause of such actions the insanity must, in general, exist at the time of making the marriage contract; incurable chronic mania or dementia for ten years—*i. e.*, after marriage—is, however, a cause for divorce in the state of Washington; and insanity after marriage, for limited divorce or separation in Arkansas. The insanity must be concealed from the complainant, and the latter must not delay his application for a remedy or act so as to ratify the marriage. Antenuptial temporary insanity is, as a rule, insufficient. Mental incapacity as a defense to charges of adultery is one of the evidences of lack of intent without which a case of this offense cannot be made out.

Logically, incapacity at the time of marriage should be a ground for a suit to annul and not for divorce. Insanity as a defense in adultery became an important question in the celebrated Mordaunt case, in which King Edward VII was named as co-respondent.<sup>1</sup> In the case of an insane defendant the consequences are sufficiently terrible, whether testimony of such defendant's guilt is admitted or refused.

<sup>1</sup> See Ordman's Judicial Aspects of Insanity, p. 339.



# MEDICOLEGAL ASPECTS OF VISION AND AUDITION

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**Acuteness of Vision.**—In the ordinary determination of visual power reliance is placed, chiefly or entirely, on the statements of the person tested. In medicolegal cases the person examined, being usually an interested party, it becomes necessary to check these statements in every practicable way. Fortunately, although vision is a purely subjective phenomenon, the conditions that influence it are so well understood, the tests for it are so diversified and elaborated, and it is so intimately associated with objective manifestations, that serious misrepresentation with regard to it cannot escape suspicion or absolute demonstration at the hands of a careful and skilled examiner.

The inaccuracy of a witness disposed to exaggerate his visual acuteness may be demonstrated by any test-letters with which he is not familiar. In almost all cases the difficulty lies in the direction of an underestimate of the acuteness of vision actually possessed. This difficulty is encountered even with persons having normal sight, who have no reason to wish it underestimated. Particularly at a first examination such persons will often stop reading the test-letters and declare they can see none smaller; yet upon continued urging, and being asked to "guess," will prove themselves able to read several letters or a whole line of smaller type. Indeed, when a person who has as yet made no mistakes declares that he cannot see another letter, it is evidence rather that the limit of his acuteness of vision has *not* been reached, for in an ordinary series of test-type it happens that some of the letters on the line read are actually more difficult to recognize than other letters of the line next smaller. Persistence in such a declaration and refusal to make any further attempt to recognize the letters would indicate a lack of honest co-operation in the test. Only when the test has been carried to where some of the letters are unavoidably miscalled has the full acuteness of vision been ascertained. Then, too, the particular mistakes that are first made are instructive. Certain letters, being harder to recognize than others, will be first miscalled; as B and S in the ordinary block letters used for such tests. Then, too, when mistakes begin, it will be certain letters that closely resemble each other that will be first confused, as O with C, or T with Y. To miscall O for T in a line where C and Y had been correctly named would at once raise the presumption of an attempt to deceive. Such inferences are, however, of little value unless the examiner is quite

familiar with the series of letters that he is using, and the mistakes most likely to be made upon it, and carefully excludes the influence of astigmatism.

When there is a suspicion that the answers obtained do not indicate truly the visual acuteness, the test should be repeated with the test-letters at a different distance, or with a different series of letters. If the former answers have not been honest, this second test will almost certainly yield a disagreement of results. Thus, if a person claims to be able to read only six-foot letters at one foot from the eye, and yet is able to read forty-foot letters at twenty feet from the eye and if care has been taken that the eye shall be equally well focused at both distances, it is demonstrated that the first claim was false, that vision is at least as good as the latter test indicates.

The need of attending to the focus of the eye must always be borne in mind in testing the acuteness of vision at different distances. Indeed, it should be attended to in connection with all tests of vision for medico-legal purposes. Defects of focus are the commonest cause of diminished acuteness of vision; and diminished acuteness from that cause must be ascertained or excluded before diminished acuteness from other causes can be recognized or estimated. For this purpose it is important to be able to measure the refraction of the eye objectively. The subjective method, depending on the answers of the person tested and the modifications of the visual acuteness by various lenses, is manifestly inappropriate. For the determination of refraction in these cases by far the best method is by skiascopy, or the shadow-test.<sup>1</sup> Determinations with the ophthalmoscope are not sufficiently exact; and the ophthalmometer does not measure the refraction of the eye, but a single factor in it—the corneal curvature. By carefully determining the correcting lenses objectively and placing them before the eye, a person willing to deceive the examiner is often made to feel the uselessness of misrepresentation, and is more disposed to give a frank answer and facilitate the examination. Most claimants of pensions, benefits, or damages really believe they have something of a case, which they do not wish to jeopardize by obvious misrepresentation or obstruction.

**The Field of Vision.**—The acuteness of vision just referred to is that possessed by the central portion of the retina—the part used for direct vision. The practical usefulness of the power of vision, however, depends not alone upon the maximum visual acuteness; for many purposes it is even more dependent upon the integrity of the visual field. A person may be able to see quite distinctly the thing looked at directly, and yet be completely blind for the greater part of the visual field, so that he will be quite unable to find objects lying out of the line of his direct vision, and may be liable to most of the accidents

<sup>1</sup> The vision of the only eye of a forty-four-year-old colleague of one of us (Brown) recently fell from 20/15 to 20/60 within thirty days. The optic nerve was clearly pale, but a skiascopy showed considerable hyperopia and corrected vision was nearly normal (20/20 less 3 letters). It now develops that the nerve has been pale two years and that tabes is present, but it must mean a great deal to be able to count on at least a few months of useful vision before blindness supervenes.

which threaten one with very imperfect sight. Harlan mentions the case of a girl suffering from *retinitis pigmentosa* with almost perfect central vision, who was able to find a rose upon the bush only by going a long distance from it, fixing the gaze directly on the flower, and keeping it so fixed until the rose was reached. A patient of Jackson with very good vision, as shown by the ordinary tests, complained of entire inability to read. Investigation showed that this was due to the limitation of the visual field, which allowed only one or two letters to be seen at a time, making the recognition of words very slow and difficult.

This form of impairment of the field of vision is often of great importance because of the light it throws upon the cause of such impairment. Concentric contraction, such as has been referred to previously, points to disease of the optic nerve or retina. Hemianopsia, or blindness in one-half of the field of vision, indicates disease within the cranium, and according to the halves affected and its association with other symptoms, tends to show the exact location and often the probable character of the cause. Loss of portions of the visual fields of both eyes, similarly located but amounting to less than half the fields, has the same significance as hemianopsia. Partial or complete blindness in smaller portions of the field of vision—*scotomata*—generally indicate disease in the optic nerve or eyeball. In general, the cutting off of a part of the field of vision does not affect the visual acuteness, as shown by the ordinary tests with test-letters. An exception to this is the case of scotoma to be referred to under the head of color-blindness. The measurement of the field of vision, therefore, requires an entirely different series of tests; these are necessarily subjective, dependent on the co-operation of the person tested; and if their results are to have much significance, such tests must be made by an expert.

**Color-blindness** has already considerable medicolegal importance. The dependence of the movements of common carriers upon the recognition of color-signals has led to the enforcement of systematic testing for color-blindness on the majority of railways, both in this country and abroad. This will, doubtless, before long be demanded of all corporations for steam transportation by land or sea as an ordinary precaution against accident. The common form of color-blindness is that in which red and green, colors almost universally used for signals, are imperfectly recognized. This form of the defect has been shown to exist in about one out of every twenty men, being much more rare among women. It is usually congenital, and cannot be remedied by treatment or scientific appliances; it usually exists for years, often throughout life, without the person possessing it knowing what is the matter with his vision, or, indeed, that anything is the matter with it.

The recognized practical tests of color vision, such as Holmgren's, or its modifications by Thomson or Williams, require the person tested to match colored wools, especially red and green. These may be supplemented by trials with colored lanterns, signal-flags, etc. No person showing a distinct defect with any one standard test for color per-



ception, even though he pass some of the tests successfully, should be permitted to occupy a post where the recognition of colored signals will be a portion of his duty. The requirements of service are liable to be more severe than any of the tests. Signal flags are used after they have become very dirty; signal lanterns may have their color greatly modified by fog; and on swiftly moving trains or vessels the instantaneous recognition of the color of the signal may be absolutely essential, so that a slight defect of color-perception may fully explain the gravest accident. The effect of color-blindness may be explained to a jury by allowing them to attempt to recognize small colored objects through colored glass. By careful selection of the tints used the effect which color-blindness must have upon its unfortunate possessor may be adequately illustrated to those who have had no previous knowledge of the subject.

An extremely dangerous, and by no means rare, form of color-blindness is that of *color scotoma*, affecting the region of direct vision. One suffering from it might be able to recognize perfectly the colors of objects large enough to impress other parts of his field of vision, yet when looking directly at a signal he would be entirely oblivious to the fact that it was a red or green, rather than a white or yellow, light. This form of color-blindness is a constant symptom of alcohol and tobacco amblyopia. It arises at or after middle age, in those whose use of tobacco or alcoholic beverages may not in any other way seem excessive, and when the quantity consumed is no greater or is often less than the individual has been accustomed to use for years. Its existence is not revealed by many of the ordinary tests for color-blindness; but no system of testing can be regarded as complete that does not include some test specially calculated to reveal it. Since it is not congenital like the other form of color-blindness, but acquired at a time of life when the service has been already entered upon, nothing but a careful test at the time can exclude it.

The danger from color-blindness in certain occupations is now fully established. The means of recognizing it are generally known, and the liability of corporations on account of it, when it is shown to be the cause of accident, cannot longer be escaped.

A very simple and entirely adequate test for central red or green blindness is the following: trim down small pieces of the red or green advertising blotters (ever present on a good doctor's desk) until they are only a millimeter square. Spread the points of a pen and insert the pieces of blotter between the tips, red on one side, green on the other. Cover the patient's left eye with the palm of his hand, bring the tip of your forefinger with the test object behind it quickly up in front of the end of your own nose, have the patient fix his eye on your finger, and suddenly remove your finger allowing him to look at the colored object. Ask him what color he sees, and if he misses, quickly shift the object to a point 3 or 4 inches to the right, left, above or below, and ask again. If he has a central scotoma he will call the color correctly. Repeat for the other fields, the other color, the other eye, etc.

**Causes of Blindness—Feigned Blindness.**—Blindness of one eye may exist for many years without being recognized, and if suddenly discovered is likely to be honestly but incorrectly ascribed to some recent cause. Where one eye has been always blind or very imperfect, discovery of this comes about by the covering of the seeing eye, either accidentally or for the purpose of testing it. Partial or complete blindness of gradual approach is likely to be suddenly discovered in the same way after it is considerably advanced. Sudden blindness affecting one eye is, however, always noticed at once, unless the eye affected has been previously imperfect and unused. The discovery of blindness in one eye after a particular occurrence cannot, therefore, be considered to raise a very strong presumption that it is due to that occurrence. In any case the thorough examination of the eye will enable the expert to reach a positive conclusion as to the real cause of the blindness. Such an examination can be made usually without danger, pain, or inconvenience to the person examined; and its results should always be available in medicolegal cases.

Such an examination must often include the tests for feigned blindness. Where blindness is feigned in both eyes, the best test to demonstrate the fraud is the placing before one eye of a prism, weak enough to be "overcome" by the turning of the eye before which it is placed, yet strong enough to cause a noticeable turning. This will be a prism of 5 or 6 degrees, with its base turned toward the nose, or a stronger prism, with the base turned from the nose. Such a prism causes double vision, to avoid which the eye is involuntarily and unconsciously turned in one direction when the prism is placed before it, and back again when the prism is removed. This turning of the eye does not occur if it does not possess useful vision. A method which has been resorted to, but is scarcely available for medicolegal cases, is the production of complete intoxication, as by ether or chloroform, and watching the behavior during the recovery. Or one may in some other way catch the pretended blind person off his guard. Two church elders brought one of their blind pensioners to the clinic of one of us (Brown). I could find no lesion and suspected hysteria. They were skeptical (for they had supported her for the twenty years since the death of her husband, an ardent church worker). I had her follow my voice as she and I walked about back and forth across an empty space till she would move quite rapidly. Then I contrived to get a nearby bucket between us without her knowledge and spoke loudly to disconcert her a bit and called her to me, and surely enough she walked carefully around the bucket to the very great surprise of the elders.

More frequently blindness of only one eye is feigned. It may be detected by placing a strong prism before the good eye, where, if both eyes see, it produces double vision. This will usually be complained of on the supposition that it depends entirely on the eye before which the prism is placed, while in reality it depends on the fact that the other eye also sees. A better test is to hold a prism of the strength mentioned above before one eye, and then suddenly to remove it. If the prism

be held before an eye really blind, no movement of either eye will occur, and none will occur on its removal. If the prism be placed before a seeing eye, the other eye being really blind, both eyes will move equally toward the apex of the prism, and they will move equally in the opposite direction on its removal. If placed before one eye when both see, the eye before which it is placed moves toward the apex of the prism, and on its removal in the opposite direction. But the other eye remains fixed or shows a brief tremor. Another test is to place lenses before both eyes, the one before the feigned blind eye being of such strength as to give it its best vision, and the one before the admittedly good eye so strong as to prevent letters being read by it. The patient being asked to read with both eyes, and doing so, it is known that he does it with the eye alleged to be blind. Or the glasses may be of such strength as to allow him to read with either eye; but only with the eye alleged to be blind beyond a certain distance. The reading being started at that distance, the page is gradually withdrawn until too far to be seen except by the alleged blind eye.

With the stereoscope certain words of a sentence or certain parts of a figure may be presented to one eye, and the other parts of the sentence or figure to the other. The impression made is as though the whole were visible to both eyes, and this can be escaped only by closing one eye. If the person tested keeps both eyes open, he will, by his description of what he sees, reveal if both eyes see. Still another test is by placing colored glasses before both eyes, one color before one eye, its complementary color before the other, and directing attention to a series of test-letters printed in these colors, the reading of which will demonstrate good vision in the eye feigned to be defective. It is found that persons having one defective eye are able to close it while keeping the good eye open, much more easily than they can close the good eye and keep the poor one open, if they are able to do the latter at all. This will be noticed if the one eye has been defective from childhood.

It must be noted that some signs often taken as indicating the possession of sight are not to be relied upon. Thus, in many cases of absolute blindness the pupils continue of normal size and react to light often as promptly as any. Still, on the other hand, the pupil may be widely dilated or absolutely fixed, although vision is perfect. The aimless stare of blindness is present only when both eyes are quite blind, but it may be simulated so as to deceive most persons, and temporarily to puzzle the expert. Loss of all useful vision may happen, although the perception of light is good; and even when all perception of light is lost, the patient does not feel that he is in darkness, and rarely admits that he has no light perception. The claim of complete loss of light perception with a sense of absolute darkness should always raise suspicion.

The examination of any medicolegal case in which disturbance of vision figures will, of course, include the complete objective examination of the eye, including its inspection with ordinary daylight, by oblique illumination in the darkened room, the thorough examination with the



ophthalmoscope, and testing of the tension of the eyeball and its movements. In connection with the latter it may be noted that persons recently blind are able to execute at will the ordinary movements of the eyes, as upward or to the right, or in any other direction, while persons congenitally or long blind may find it difficult or impossible to make such voluntary movements.

### THE EYE IN LIFE INSURANCE

Ordinary examinations for life insurance include the inspection of the eye. The most definite indications that it gives are by a paralytic squint of syphilis, rheumatism, or disease of the central nervous system; by iritic adhesions of syphilis or rheumatism; by absence of the normal reactions of the pupil of organic nervous disease, as tabes; and by ophthalmoscopic changes, such as choroiditis or retinitis pigmentosa pointing to syphilis, cataract, and certain retinal changes indicating diabetes, and by albuminuric retinitis, optic neuritis, and optic atrophy. The change in the cornea giving rise to the *arcus senilis* has often been taken to indicate senile failure of general nutrition, but has no such significance. We have seen it at four years of age; and it is often very marked in healthy persons, who show unusually little evidence of senile failure, and continue healthy for many years.

It is perhaps too much to expect the use of the ophthalmoscope in all life insurance examinations, but whenever albuminuria is found, it should be resorted to, because of the great significance of the retinal changes of albuminuric retinitis when they exist. Most of these cases terminate in death within two years after the development of retinal lesions.

Again, severe recurring headaches or other indications of possible organic brain disease should lead to examination for optic neuritis; and family or personal history suggesting degenerative changes in the cerebrospinal system should bring to mind the possibility of optic atrophy, which is an early symptom in many of these cases.

Impairment of the vision in one eye, or loss of some portion of the visual field, causes an especial liability to accident that may have an important bearing in this connection.

In iritis one should now look for focal infections, such as abscessed teeth and tonsils, infected sinuses, gall-bladders, appendices, prostates, and old gonococcal and tuberculous processes, etc., as well as for syphilis, which until very recently, at least, was considered by us all to cause "by far the great majority of the cases of iritis" (Fuchs).

**Injuries to the Eye.**—When an injury to the eye is liable to become the occasion of a claim for accident insurance or damages, a thorough examination of it should be made at the earliest practical moment, to determine not only the exact nature of the injury but also, so far as possible, to recognize or exclude the effects of previous disease or congenital anomalies. Thus an eye some weeks or months after injury might present opacities of the vitreous, which, it might be claimed, on the one hand, were due to hemorrhage from the injury, or, on the other

hand, to choroiditis at an earlier period. The examination immediately after the injury would in the latter case reveal the opacities already present and chronic; while in the former case the actual presence of the blood-clot would be demonstrated. In another instance, after injury to the head, blindness discovered with atrophy of the optic nerve might be due to an old atrophy, discovered only after the time of injury; or it might be due to the injury causing pressure on the nerve at the optic foramen. The early examination would in the one case show the atrophy previously present; but in the other the ophthalmoscopic changes would not be developed until after the blindness had been present at least for some days.

Examinations of the eye soon after injury cannot, however, settle the question of ultimate damage to it. Thus absolute blindness from extensive hemorrhage may in the end be followed by full restoration of sight. On the other hand, injuries apparently trifling at first may lead to ultimate blindness. Even with the lids, an injury of moderate extent may be followed by cicatricial contraction causing great deformity and loss of function in the eye.

Whenever an eye has been injured by a flying object and even when it is stated that the object was of considerable size, as in the case of a nut or bolt, it is very advisable to have an *x*-ray made. One of us (Brown) knows of three instances in which one or more competent oculists neglected to do this (or feared a corporation would object on the score of expense), and months later some colleague has noted siderosis and proved iron to be in the eye by *x*-ray.

The special bearings of sympathetic ophthalmia will be discussed under the next head.

**Malpractice.**—Suits for malpractice may, of course, arise from any conceivable form of error or neglect, real or alleged, on the part of the attending surgeon. But they have most frequently grown out of operations upon the eye or cases of sympathetic ophthalmia. With regard to any operation the surgeon should admit a certain risk, however slight, as necessarily attaching to it; and he should use ordinary precautions as to cleanliness and the subsequent rest of the eyes. It is also important that the patient shall be made, in the presence of a competent witness, to understand fully the object of the operation. Thus a suit has been based upon failure to improve vision in an eye necessarily blind, when the operation was undertaken only to give a better cosmetic effect.

Sympathetic inflammation leading to blindness of the second eye, after the loss of one eye by injury, is so grave an occurrence as to have given rise to many actions for malpractice, generally without the slightest reasonable foundation. But no eye lost by traumatism is safe from the danger of exciting this disease, and in every case the patient or his proper representative or guardian should be warned that there is this danger, and that the removal of the eye is the best means of avoiding it. The responsibility for the retention of the eye should then be clearly thrown upon its possessor. Having attended to this, even though the

sight of the injured eye is not entirely destroyed, the surgeon can frankly state his opinion of the probabilities of the particular case. If the injury, even though apparently slight, includes the penetration of the sclera, ciliary body, or vitreous, or the lodgment of a foreign body within the eyeball, the danger of sympathetic disease should be indicated.

It is remarkable that very few cases of sympathetic inflammation have developed during the World War despite the injury of thousands of eyes. This experience has not been confined to any one country, indeed, it seems to have been quite general, though accurate reports are as yet scarcely at hand. It is too early to speculate upon the reason for this.

In numerous cases suit has been brought on account of the removal of the eyeball, the claim being that this was not necessary or justified by the severity of the injury. Frequently, when a foreign body is lodged within the eye, the patient regards the injury as comparatively trifling. The eye may still retain full vision, and yet ultimate blindness, with great danger to the second eye, may be clearly evident to the surgeon from the first. Against such actions the proper safeguard is to obtain, in the presence of witnesses, the full consent of the patient or his guardian before proceeding to remove the eye, and to preserve notes of the facts which justify the removal. It is probable that in the next few years the question will be raised as to whether some of the substitutes for enucleation of the eye, as evisceration or Mules' operation, are equally safe preventives of sympathetic diseases in the second eye. It cannot yet be regarded as established that they are equally safe; and where resorted to as a substitute for the older operation, their merits and possible risks should be explained to the patient, who may then be allowed to indicate his choice between them.

### ACUTENESS OF HEARING

The determination of audition is necessarily less exact and certain than the determination of vision. The examiner has fewer methods of checking the statements of the person examined. His determinations, therefore, are of less certain significance, and demand the greatest possible confirmation in the symptoms discovered by objective examination and the general behavior of the person in regard to sounds. Different methods should be employed and repeatedly, as the testing with the watch, the acoumeter, and with carefully selected words, bearing in mind that even with a well-trained voice the clearness of tone necessarily varies from time to time, and that the variations as to the distance at which different words spoken in the same tone can be heard are very great.

The determination of the power of hearing in either ear separately is to be made by stopping the other ear either with the wetted fingertip or a plug of cotton. To ascertain whether sounds are heard by the ear supposed to be stopped, the stopping also of the supposed hearing ear is resorted to; when, if the sound can still be heard, the stopping



of the first ear has been incomplete. The test with the tuning-fork placed on the cranium is of importance, because its sound is usually heard best in the stopped or the defective ear. But care must be taken that the hearing of higher or overtones is not confused with better hearing.

The ability of some deaf persons to read the lips makes it important that voice tests shall be so conducted as to exclude this source of error. When there is doubt as to the honesty of the patient's statements, it is well to make all the tests of hearing with the eyes blindfolded, so that it will be very difficult for the person tested to give dishonest answers that would still have an appearance of consistency. Deafness of one ear may be tested by the binaural stethoscope or similar instrument. One tube is to be applied to each ear, and the test conducted from behind the patient, so that either ear can, without the patient's knowledge, be shut off from the sound by pressing on the corresponding tube.

The objective examination of the ear in a medicolegal case must include, with thorough inspection of the external ear and drum membrane, the examination of the nasopharynx; and it should note the presence or absence of all evidences of possible disease.

## CONDITION OF THE EAR IN LIFE INSURANCE

Besides the increased risk of accident which severe deafness, even of one ear, entails, certain diseases of the ear are directly dangerous to life. Cancer or lupus would, of course, have the same significance here as elsewhere. But suppurative disease of the middle ear, so long as it exists, must be regarded as a source of grave danger, greater if there be a tendency to obstruction from polypoid growths or narrowing of the meatus or caries of any part of the bony meatus or middle ear. A permanent perforation of the drum membrane must be regarded as a predisposing cause to suppurative middle-ear disease. Symptoms of disease of the internal ear are significant as pointing toward the existence of brain lesions.

**Injuries of the Ear.**—These, like other injuries, demand careful study as soon as possible after their reception. The appearances of a fresh rupture of the drum membrane, or recent clots, will in time give place to appearances that cannot be differentiated from those due to chronic disease. Careful examination of the ear should be included in all cases of serious head injuries. No general rules can be laid down for the determination of the gravity or permanence of the results of these injuries. Malpractice suits have not very often grown out of ear injuries or treatment, but with increased attention to the subject and the more frequent resort to numerous operations, some of which can now be regarded as only experimental, actions based upon them are liable to arise. In cases of operation for catarrhal deafness our knowledge of the subject is not such as to justify the surgeon in proceeding without a careful explanation to his patient of risks and possible results, thus placing the responsibility largely upon the patient.

# MEDICOLEGAL RELATIONS OF VENEREAL AND GENITO-URINARY DISORDERS

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## IMPOTENCE

**Definition.**—By “impotence” is meant the lack of ability to perform the sexual act. This term must not be used interchangeably with sterility, yet this is often the case. This condition is not necessarily associated with sterility, and, likewise, a person who is sterile is not necessarily impotent. However, one may be impotent and sterile at the same time. As illustrations may be mentioned that a person with feeble or wanting erections or with premature ejaculations may discharge perfectly normal seminal fluid, whereas one who is especially vigorous sexually may discharge fluid in which spermatazoa are absent or dead, or perhaps there may be no emission at all.

Various classifications of the causes of impotence have been given, among them being organic and psychic. These are more or less arbitrary. Of utmost importance in each and every case of sexual impotence is the determination of the causative factor or factors, for, without a most careful search for the underlying cause, treatment and cure cannot be intelligently carried out. In many cases the battle is half won once the underlying causes are established. Needless to state in just this type of case it is essential to have a strong grip upon the confidence of the patient.

### ORGANIC IMPOTENCE

By organic impotence is meant the presence of appreciable lesions which interfere with function. Various congenital lesions of the penis may be mentioned, such as absence of the penis or a rudimentary or small penis. The outlook for relief in these cases is hopeless. Abnormally large size of the penis has been mentioned as a cause of impotence, as the case quoted by Robinson, in which the penis was so large that introduction was impossible and coitus was performed only intramammas or intrafemora.

Webbed penis, where the penis is adherent to the scrotum, loss of the penis due to ulceration, and the presence of tumors of the penis may prevent the performance of the act. Congenital malformations, such as epispadias, in which the urethra opens on the dorsum of the penis, or hypospadias, where the urethra opens on the under surface of the penis, may or may not be causes of impotence. This depends upon the location and extent of the malformation. In some cases

of hypospadias the downward curvature is so marked that intromission is impossible. Downward or upward curvature of the penis of a degree sufficient to cause impotence is associated with hard fibrous infiltrations of either the erectile tissue or the sheath. Because of interference with the erection of the penis beyond these infiltrations (fibrositis) the end of the organ remains flaccid. The cause of these infiltrations is unknown and the treatment may be unsuccessful. It is believed they are common in the gouty, rheumatic, and syphilitic.

Congenital malformations and various diseases of the testes may produce impotence. The impotence is complete where both testes are congenitally absent.

Cryptorchidism, in which the testes have not descended into the scrotum, is not a cause of impotence, although these patients are generally sterile. Castration is ultimately followed by impotence as a rule. However, there may be exceptions, as it is known that the general supposition that eunuchs are impotent is not true; some castrates are very powerful in this respect (Robinson). Atrophy of both testes following mumps does not always render the patient impotent. Large hydroceles and the presence of a large hernia may render a man impotent because of the mechanical impossibility of effecting intromission. The rôle played by varicocele is somewhat doubtful. Many patients ascribe the impotence to the presence of a varicocele, and their views are given strength and support when they consult the quacks who attribute all sexual ills to the varicocele, for which an operation is urged. Many men with large varicoceles are perfectly potent and many men who are impotent have no varicocele. Still, once in a while the removal of the varicocele by operation effects a cure. Perhaps the cure could have been produced in other ways, leading one to the belief that the impotence may have been psychic. Disease involving both testes, such as degeneration, tuberculosis, syphilis, and malignant tumor, generally results in both impotence and sterility.

Gonorrhea, *indirectly*, is the most frequent cause of impotence. It is not during the acute stages of an urethral gonorrhea that gonorrhea is a factor in the production of impotence, but rather the impotence is due to lesions of the male genital tract that are the sequence or result of infection of the prostate and seminal vesicles by the gonococcus. The impotence may not be apparent until several years after the acute attack of gonorrhea, when careful examination shows the presence of chronic inflammatory lesions of the prostatic urethra, verumontanum, prostate, seminal vesicles, and the ampullæ, and a careful history elicits the fact that the patient had involvement of his internal genitalia at the time he had gonorrhea and that no treatment was given him at the time. Not all inflammatory conditions in the internal genitalia producing impotence can be attributed to previous gonorrheal infection. They may be due to organisms other than the gonococcus. Lesions of the prostate other than the above-mentioned infections may produce impotence, namely, hypertrophy and carcinoma. The impotence associated with senile enlargement may be temporary.



In a great many cases of patients in whom the prostate was removed sexual power returned. Sexual excess undoubtedly may lead to impotence.

The rôle played by masturbation in the production of impotence is by no means a settled one. Thus Robinson states that "this is a very common cause because practically every human male begins his sexual life with masturbation, and while the habit, if commenced fairly late and practised moderately, in the majority of cases leaves no ill effects, there is no question that if commenced at the age of ten, twelve, or fourteen and indulged in immoderately, it may lead to relative or complete impotence, temporary or permanent." According to Martin, Thomas, and Moorehead, "masturbation as a cause of impotence is generally given prominence which is not deserved." They state further that it is a habit which practically all boys have had at one time, and that the *popular* belief as to the injury which even a slight indulgence in may cause leads those who have sexual trouble to refer this back to self-abuse. Even when the habit is continued for years during the period of youth and early manhood it is often followed by no appreciable ill-effects. It is undoubtedly true, however, that in certain instances, aside from the rooted connection of the patient, irritative and paralytic forms of impotence can be referred directly to excessive masturbation.

Certain abuses of the sexual function lead to impotence. Excessive venery is often followed by impotence, which may be partial or complete. One of the results of our present civilization with its attendant increase in the struggle for existence leads many newly married couples to prevent conception or limit the size of their families, to prevent which the practice of withdrawal or interrupting coitus is carried out. This is a most pernicious practice, and is no doubt a common cause of various forms of sexual disturbance, as well as neurasthenia and even melancholia. Imperfect erections as well as premature ejaculations can often be attributed to this form of practice.

Lesions of the central nervous system, notably locomotor ataxia and syphilis of the nervous system, have as an early symptom impotency.

The continued use of drugs, such as morphin, cocain, and bromids, is often associated with impotence. Tobacco, it is claimed, when used to excess dulls sexual desire and eventually leads to impotence.

Certain constitutional diseases are often associated with impotence, such as tuberculosis, diabetes, leukemia, pernicious anemia, obesity, etc.

The vocation of the individual may find expression in his sexual apparatus. Thus the big business man often pays for the high tension under which he labors by a weakness of sexual function or ultimately by becoming gradually impotent. Worry, the loss of a wife, etc., may produce the same result, although this is generally only a temporary state. Those whose work is purely intellectual, such as mathematicians, philosophers, etc., are notably often affected by impotence

while other vocations result in a direct stimulation of sex function. To the latter class belong poets, artists, sculptors, actors, and singers.

### PSYCHIC IMPOTENCE

Cases belonging to this group present no abnormality in the external or internal sexual organs, and no evidence of disease in the sexual organs, nor evidence of constitutional or general disease. Erections are possible, but not under the control of the will, so that intercourse cannot be carried out at the required time; the patient may wake up in the morning with a vigorous erection or erections may be easily provoked at times other than when desired. Often this type of impotence may be met with in newly weds, due to lack of confidence, often attributed to previous masturbation. Not infrequently this form of impotence follows fright or surprise. Fear plays a very definite rôle in some cases; that is, fear of impregnation, of detection, or of contracting a venereal disease. This form of impotence has followed mental impressions, such as disgust of a partner's dirty undergarments. Whether marital dislike as a factor of impotence should be classed as psychic is problematic.

### IMPOTENCE IN THE FEMALE

Impotence in the female is rare. Among the causes may be mentioned a congenitally small vagina that renders intromission impossible, and a very thick, tough hymen. Another rare cause of impotence is vaginismus, this being a state in which true impotence may be present. Vaginismus is a hyperesthetic condition of the vulvovaginal orifice characterized by painful and spasmodic contractions of the muscles of the pelvic floor, but more especially of those surrounding the vulva and lower part of the vagina. In some cases the spasm involves the levator ani muscle and the muscles of the thighs, and there may also be general convulsive movements of the entire body (Ashton). This condition produces horror on the woman's part at any thought of sexual intercourse. The cause cannot always be discovered, hence treatment is often very difficult.

### STERILITY

Sterility in the male is that condition in which there is loss of procreative power. This necessarily implies the absence of living spermatozoa, since these are the elements essential to impregnation, but it does not imply failure of power in sexual congress (White and Martin).

Formerly the question of sterility in the male received scant consideration. Whenever the question of childlessness was discussed it was the female who was held responsible. She it was who went from doctor to doctor seeking advice and treatment, which often consisted of useless local treatment; failure of this was followed by instituting various surgical operations without avail, and all the time the fault lay with the husband. In view of our present knowledge of this subject, the examination should always begin with the husband,

which procedure is rapidly becoming the recognized one. It is a simple process to have the candidate bring in a fresh condom specimen for microscopic examination. This almost at once determines whether or not he is sterile. There may at times be a temporary absence of sperms which can be controlled by a second test. This method has fastened the guilt upon the husband, absolved the wife as being the cause of a barren wedding and, last but not least, has avoided one or several unnecessary operations upon her for causes that did not exist.

Nor must it be forgotten that certain couples are sterile although complete physical examination of both husband and wife reveals no cause for the sterility. Such couples have separated and remarried, the second marriages resulting in each having children. In other words, one might say that these persons are individually fertile but conjugally sterile.

The causes of sterility are many. A man may have the power of erection and his ejaculation may contain sperms, but he may be sterile because of certain factors that prevent him from carrying out the sexual act. Here may be mentioned a small rudimentary penis, extreme hypospadias and epispadias causing a discharge of the semen outside the vagina and the presence of large scrotal hernias or hydroceles. Some of these causes may only be relative, because by certain manipulations impregnation may be possible.

Since the testes are the organs which generate the spermatozoa various lesions in these organs may result in sterility. These may be congenital or acquired. Absence of the testes may be congenital or acquired. Acquired absence may be the result of injury or operation for disease, such as tumor or tuberculosis, although bilateral tumor is rare. The testes may be present in the abdomen or inguinal gland, but absent in the scrotum. This condition is called *cryptorchidism*. It is generally believed the patients with bilateral cryptorchidism are sterile. Atrophy of both testes renders the patient sterile. The most frequent cause of atrophy is mumps, which not infrequently has, as one of its not uncommon complications, an inflammation of the testicle, orchitis, which is often followed by atrophy. Fortunately one testicle is more often the seat of inflammation occurring during mumps than is involvement of both testes. Orchitis followed by atrophy may be due to other infections than mumps.

The testes may both be present and functioning, but the sperms cannot escape, due to real mechanical obstruction somewhere in the tract. The most frequent cause of obstruction is to be found in the epididymis, and the most frequent cause of epididymitis is gonorrhea. This has led to the statement, and doubtless a correct one, that gonorrhea is the most frequent cause of sterility in the male. As a result of gonorrheal infection in the male, epididymitis is a frequent complication and as a result of this inflammation permanent occlusion of the ducts occurs so that the spermatozoa are locked up. The seat of this obstruction is often found in the tail of the epididymis. To overcome this type of sterility, Hagner devised an operation in which the vas



deferens is transplanted into a part of the epididymis that contains live spermatozoa.

In every case of barren marriage careful inquiry of previous gonorrhea in the male should be gone into with special reference to previous epididymitis. If this has been bilateral it is believed that chances for sterility are six out of ten. Tuberculosis of the epididymis is the next most frequent lesion of the epididymis that produces sterility. It is claimed that a very low-grade inflammation of the epididymis may occur without producing symptoms that direct the patient's attention to his genitals, and that this may result in sterility. Occasionally a thickened epididymis can be felt, yet the patient is unaware of ever having had an attack of epididymitis. Stricture of the vas deferens, if bilateral, may result in sterility.

Probably the most frequent lesion of the urethra resulting in sterility is the presence of a tight stricture, so that the semen does not escape during ejaculation, but either flows out slowly at the end of copulation or it may regurgitate into the bladder. Such a stricture may or may not produce difficult urination. The term "retro-ejaculation" has been applied to this condition.

Certain obstructive lesions of the ejaculatory ducts may produce aspermia, such as ulcerative lesions of the deep urethra, and various lesions of the prostate gland, abscess, hypertrophy, cancer, and not infrequently tuberculosis.

Another remote result of gonorrhea leading to sterility is chronic prostatitis and chronic seminal vesiculitis. These complications, so often part and parcel of gonorrhea, are too often overlooked. These conditions are frequently amenable to treatment, hence may be considered only as relative.

One of the more recent causes of sterility is the Roentgen ray. When the  $x$ -rays were first introduced, workers in this field were insufficiently or perhaps completely unprotected from the action of the rays. The sterility following was usually only temporary as proved by animal experimentation. Since the workers with the rays are now so well protected, this factor is almost negligible. During this period of sterility sexual desire and erections are not impaired.

Radium can produce a similar result, but with the present methods of screening this hardly enters into discussion as a factor.

Certain general diseases may result in sterility. These are generally essentially chronic, such as obesity, gout, diabetes, and grave anemias.

To describe the various conditions relative to sterility the following terms are used:

**Aspermia.**—An entire absence of semen, a condition in which no seminal fluid is ejaculated during intercourse.

**Oligospermia.**—A condition in which there is a diminution in the quantity of semen ejaculated.

**Oligozoöpermia.**—A condition in which the semen contains but few spermatozoa. According to White and Martin this may be a transitory condition in healthy men.

**Azoöspermia.**—Complete absence of spermatozoa in the semen.

**Necrospermia.**—In which the sperms are present in the freshly obtained semen, but they are dead.

## STERILITY IN WOMEN

Reproduction implies the transmission of an ovum through the Fallopian tube to the uterus, fertilization of the ovum by spermatozoa transmitted through the genital tract, and embedding and growth of the fertilized ovum in the uterine mucosa (Webster). Interference with any of these processes may lead to sterility. Sterility may be the result of surgical operations in which both ovaries or both tubes or the uterus, or all of these organs have been removed.

Although sterility in women may be due to a variety of causes, the fault is sometimes wrongly placed upon the woman, and in determining the cause of sterility both husband and wife should be examined.

Various lesions of the *ovaries* may be the cause of sterility. The ovary may be rudimentary or absent; the absence may be congenital or due to a surgical removal. Malposition of the ovaries, such as extreme prolapse, may make it impossible for the ovum to reach the Fallopian tube. Adhesions surrounding the ovaries may likewise interfere in this function. Among the more frequent lesions of the ovary is inflammation. Tumors of the ovary, either solid or cystic, may tend to destroy the ovum-producing power. Large tumors of the ovary besides destroying the function, may interfere with the opposite ovary in a mechanical way.

Diseases of the *Fallopian tubes* are a frequent cause of sterility. The most frequent cause is an inflammation of both tubes; and the most frequent cause of inflammation of the Fallopian tubes is gonorrhea, as a result of which the tubes are closed and the ovum cannot pass into the uterus. Congenital absence is rare, but absence due to operations or inflammation is common. Cases have been reported in which pregnancy did take place after removal of both tubes. This it is believed is due to a reopening of the end of the tube left attached to the uterus. Operations have been performed on the tubes to prevent pregnancy. Double ligation and division of the tube does not always insure against pregnancy, for the uterine end may again become patent. Displacement of the tubes, bends, and kinks may likewise result in sterility. Tumors of the Fallopian tubes are very rare, and hence can be a factor only in an occasional case.

There are many *lesions of the uterus* that may be factors in sterility. Absence of the uterus may be congenital or acquired following its removal for disease. Various malpositions of the uterus, such as retropositions and antelexion, may be associated with sterility. The passage of the ovum or spermatozoa may be interfered with when one of the various flexions are present. An unusually long neck of the uterus and a very small os are causes of sterility. Various inflammatory conditions either in the body of the uterus or in the cervix may often prevent conception.

The most frequent cause of uterine inflammation is the gonococcus. Some doubt exists as to just how inflammation of the uterus prevents conception. Many believe that the presence of pathologic secretions destroy the sperm, while others maintain that changed mucosa prevents the ovum from embedding.

Pregnancy may take place in the presence of fibroid tumors, but this is rather rare. Fibroids are common tumors and the incidence of pregnancy and fibroids is not great. Cancer of the uterus is almost certain to prevent conception.

Lesions of the vagina may prevent conception. Where extensive lacerations are present, with resulting prolapse, the semen may not be retained after sexual intercourse.

Inflammation of the vagina prevents conception due to the presence of altered secretions which destroy the spermatozoa.

In addition to the above-mentioned local causes there are general causes, chronic wasting disease, such as the various anemias, adiposity, diabetes, and others.

### GONORRHEA

Gonorrhea is an acute infectious disease due to the gonococcus. It is most frequently seen in the urethra, although infections of the eye and rectum do occur.

The gonococcus is a micro-organism having certain definite characteristics. It was discovered in gonorrheal pus in 1879 by Neisser, of Breslau, and was cultivated by Bumm in 1885. The gonococcus is described as a micrococcus occurring in pairs or in groups of four. The elements making up the diplococcus are flattened on one side so that a free interval is seen between them in the stained specimen. Because of their appearance they have been designated as biscuit shaped or coffee-bean shaped. In a fresh specimen of gonorrheal pus the gonococcus is found within the pus-cells, and sometimes in the epithelial cells, although it may also be found extracellular. It possesses certain staining reactions, being readily stained with basic dyes, such as methylene-blue. In order to differentiate it from other diplococci that may occur in an urethral discharge the pus is stained with Gram's iodine stain. The gonococcus is Gram-negative, that is, it does not take the Gram stain. It is impossible to cultivate the gonococcus upon ordinary culture-media, but it is best grown upon human blood-serum, and it requires thorough experience and much bacteriologic skill to be successful in its cultivation. The gonococcus cannot be inoculated upon laboratory animals. It possesses but little vitality outside the body and is readily killed by drying and by heat.

### GONOCOCCAL COMPLEMENT-FIXATION TEST

This test was described by Swartz and McNeil in 1911. The reaction is generally positive in the sixth to eighth week of an acute gonorrheal infection, rarely becoming positive before the fourth week. It may never become positive in cases that are so successfully treated



as never to have much infection. A focus of infection, such as a joint involvement or infection of a Fallopian tube, may keep up a positive test long after all signs of urethral infection have disappeared.

According to Keyes, the "urethral lesion may be so slight and superficial that the complement-fixation test becomes negative before the last gonococcus has disappeared. The fixation test usually remains positive two to six weeks after all clinical evidence of infection has disappeared from the urethra and its glands, but it may persist for months. He further states that the reaction presents two interesting features:

1. If within three weeks of the time when a fresh urethral discharge appeared the patient's blood is found positive, the discharge is probably a relapse from a previous infection. If negative, it is doubtless a new one. The nearer the test is made to the beginning of the infection, the more accurate it is likely to be.

2. The reaction of a person who has not recently had a gonorrhea cannot be made positive by the injection of gonococcus vaccines; but if the complement-fixation test has been positive within the preceding six months and vaccines are given, it is readily made positive.

In cases with complications, such as gonorrheal rheumatism, chronic prostatitis, and chronic seminal vesiculitis, the test may be positive when history of recent infection can be obtained, although there may be no evidence of urethral gonorrhea.

### TRANSMISSION OF GONORRHEA

The transmission of gonorrhea is always an interesting topic; that is, whether or not a gonorrheal urethritis is ever acquired outside of sexual intercourse. There are numerous reports in the older literature that attempt to prove that the germ may be conveyed to the urethra in an innocent and accidental manner. These cases must be and are very rare. I have never seen one. It is quite possible, however, for the disease to be transmitted from one patient to another by careless use of instruments that are infected with gonococci. However, implantation of gonococci into the urethra occurs almost exclusively during sexual congress. The common use of douche points by women has resulted in transmitting the gonococcus. Cases have been seen where a woman who is infected, but unaware of this fact, uses another woman's douche point, the latter becoming infected and transmitting the disease to her partner. She is then accused of being untrue and may have a difficult time to prove that she has not been.

According to Keyes, "Less direct methods of contagion may be looked upon with suspicion. The mythical bath-tub and the legendary privy are calculated to excite derision. However certain it be that vulvovaginitis in little girls commonly results from indirect contagion, and that infection of an adult from a drop of pus on the edge of the closet seat is perfectly possible, it is, nevertheless, singular that such a mode of infection is alleged almost exclusively by persons who are interested in concealing a transgression."

That gonorrhea may be acquired without intromission is possible; "It is possible for the male to abstract outlying gonococci from the vulva of a timorous partner without effecting intromission" (Keyes).

### GONORRHEA OF THE EYE

Gonorrheal infection of the eye is exceedingly rare in adults if we stop to consider the large numbers of men and women in any large city who are infected and the few cases of gonorrheal disease of the eye that are seen. Among the lower classes, such as one sees in dispensary practice, a group of patients both ignorant and careless, one would expect to see eye infections occurring frequently during the course of an acute gonorrhea, yet these are rare in spite of the fact that many of these patients handle the genitalia and take their injections, but rarely wash their hands afterward. Gonorrheal keratitis does occur, but it is not frequent. It occurs often as a complication of involvement of the prostate gland and seminal vesicles.

Infection of the eyes of the newborn is more frequent and means that the mother is infected. This is one of the most common causes of blindness in the United States and is entirely preventable if a solution of silver nitrate is instilled into the baby's eyes immediately after birth (Crédé's method).

### GONORRHEA OF THE RECTUM

In the male it is generally due to the practice of sodomy, whereas in the female the infection may be due to inoculation of the rectum with pus from the vulva, or it may be due to infection from the douche point.

Gonorrheal infection of the nose and mouth are rare. Skin complications are very rare. Recently attention has again been called to the occurrence of hyperkeratosis as a complication. This has been called *hyperkeratosis gonorrhoeica*. An excellent illustration may be seen in the *Handbuch der Geschlechts Krankheiten*, vol. 2, page 307.

### GONORRHEAL ARTHRITIS (RHEUMATISM)

This is probably the most frequent manifestation of metastatic gonorrhea. A patient who has had an attack of gonorrheal arthritis during one attack of gonorrhea is prone to develop this complication with his subsequent attacks of gonorrhea. This complication is rare before the third week. It does not occur unless there is an associated infection of the prostate gland or seminal vesicles, or both. The disease may involve one joint or it may be multiple. The knee-joint is most frequently affected. The tendons and bursæ around the joints may be involved at the same time. This complication is rare in cases that are seen from the start and that are efficiently and successfully handled.

One other complication deserves special mention, and that is involvement of the heel, so-called "policeman's heel." When seen the os calcis is very painful and tender and an examination with the Roentgen

rays shows the presence of exostosis of the under surface of the heel, a most disagreeable and painful condition to treat.

Gonorrheal infection may involve the heart, producing endocarditis or myocarditis; it may involve the muscles, producing myositis. Gonorrheal pleurisy, pneumonia, neuritis, and meningitis are rare.

### EXTENSION INTO THE GENITAL TRACT

In the male, during the early weeks of the urethral infection, it tends to remain localized in the anterior urethra. Unless the disease is eradicated during this period, it tends to progress and to involve the follicles and crypts of the anterior urethra, later involving the posterior urethra, prostate gland, and seminal vesicles. Stricture is a late complication.

In the female the disease involves the urethra and the glands adjacent thereto, Skene's glands, etc. Involvement of the cervix and Bartholin's glands are present early during the disease. Later the infection spreads to the uterus, Fallopian tubes and ovaries, as well as the peritoneum, generally as a localized peritonitis. Generalized peritonitis due to the gonococcus does occur, but it is rare.

Involvement of the kidneys and ureters is rare.

### CURE

The views of the profession regarding cure have undergone a very decided change. The old saying, "Once a gonorrhoeic, always a gonorrhoeic" is just as fallacious as the statement of the light-hearted physician himself, perhaps an old rue, that a slight persistent discharge is harmless.

The present education of the public along venereal lines demands that patients wish to know the true status of their condition at the end of their course of treatment. In other words, a patient wants to know if he has been cured and if he may safely marry. This places the responsibility directly upon the physician, and his consent to matrimony should be a guarantee against the possibility of a recurrence of the disease and resulting infection of the wife. To deny a patient the right to marry because he has had gonorrhea is just as wrong as it is to give consent to marriage without a thorough, complete, and comprehensive examination to establish freedom from infection.

The various steps to be taken in establishing a cure have practically become standardized. A slight urethral discharge must be examined many times for the presence or absence of gonococci, and if these cannot be found in the stained specimens, repeated cultures must be made. The same applies to the gonorrheal shreds that may persist in the urine.

Often the prostate gland and seminal vesicles may harbor gonococci that may infect the newly married woman, and for this reason the prostate and seminal vesicles must be stripped in order to demonstrate the presence or absence of pus. These strippings must be stained and most carefully examined for gonococci. If they cannot be found in the strippings, these strippings should be subjected to repeated bacterio-



logic culture. The passage of large urethral sounds and injections of strong solutions of silver nitrate as methods of producing a reaction and bringing to light latent gonococci hidden in the urethra should be done in each case before consent to marriage is given. Ingestion of alcohol as a provocative measure can be then used. If in doubt, it is desirable to instruct the candidate for matrimony to resort to the use of a condom during the early period of his honeymoon.

Although this problem is not quite so simple in the female, it should be followed out just as religiously as in the male. It is no uncommon occurrence in this day and age to have women present themselves to the physician to ascertain if they are free of antecedent gonorrhea.

Health certificates as requisites to matrimony, as they are generally issued, are often short of being a farce. In some states only the male is required by law to present a health certificate. In order to make this institution most efficient both parties should present a real health certificate.

### GONORRHEA IN CHILDREN

Gonorrhea in boys is relatively uncommon. The course and complication of the disease is the same as in adults. Often it is impossible to trace the source of the infection, but not infrequently a maid infected with gonorrhea will be found as the apparent source. This is especially true in very young boys. There is an old superstition that if a female infected with gonorrhea can touch a virgin she will be cured, and this seems, in some instances, to be the reason for the infection. In older boys it is due to attempted intercourse.

Gonorrheal vulvovaginitis is not so uncommon in girls. The largest number of these are accidental infections. By some it is doubted whether these are true cases of gonorrhea. The reasons advanced for this doubt is the fact that these children do not develop gonorrheal ophthalmia nor gonorrheal arthritis. The highly infectious nature of the disease, they claim, does not fit in with gonorrhea of the adult. When a girl with vulvovaginitis is admitted to a hospital ward, the disease is soon transmitted to all the other girls in the ward, hence the necessity for the most extreme care and caution, not only in admitting these patients into a ward but great precautions are necessary to prevent the spread of it in the ward.

### PROPHYLAXIS

The wonderful records of the armies during the World War would seem to demonstrate the great value of prophylactic treatment. This to be efficient must be instituted immediately after exposure. The longer the interval between the exposure and the application of prophylaxis, the more liable it is to fail. The rapid diminution of the venereal rate in our armies was apparent after the general order was passed by General Pershing, making it a court martial offense if a soldier developed gonorrhea after failing to avail himself of prophylactic treatment immediately after exposure.

## SYPHILIS

## ETIOLOGY

Since the last edition of this book a great revolution has taken place in the entire subject of syphilis. Three important discoveries have been responsible for this new era of knowledge. They are the discovery of the cause of syphilis, the elaboration of the Wassermann test and the introduction of salvarsan (606) in the treatment.

Syphilis is due to an infection by the *treponema pallidum* (*spirochæta pallida*, *spironema pallidum*). This organism was discovered jointly by Schaudinn and Hoffmann in 1905, the first a zoölogist and the latter a trained syphilographer. Siegel in 1905 announced the discovery of the cause of syphilis and gave to it the name of *cytorrhcytes luis*. A commission was appointed in Berlin to confirm the claims of Siegel. Schaudinn was placed at the head of this commission and Hoffmann was associated with him. Their work showed that the organisms of Siegel were in reality artefacts, and as a result of their check up on Siegel's work they discovered the *spirochæta pallida*. The exudate of a chancre from a young woman was examined microscopically and a number of fine spirilla were seen.

The news of this discovery soon spread all over the world, and confirmation of the claims of these two workers was soon forthcoming from all parts of the scientific world. Unfortunately, Schaudinn died soon after making his epoch-making discovery.

The *treponema pallidum* can be found in the initial lesion or chancre, in the secondary lesions of the skin, and in the lesions of the mucous membranes. In the greatly indurated chancre or in chancre that has been treated with caustics and strong antiseptics, one may fail to find the organism at the first or even in subsequent examinations. Search to be successful must be repeated and in untreated lesions. If the lesions have been treated, all treatment should cease, weak boracic dressings applied and search taken up again a few days later. This is carried out by means of dark field illumination. Since its discovery the *spirochæta pallida* has been found in all syphilitic lesions, in all organs of the body, such as the brain, heart, blood-vessels, liver, spleen, bones, and the blood- and lymph-glands. It has even been found in the urine and spermatie fluid of men, and in the milk of women (Thompson). The presence of *spirochæta* in the sperms has been questioned.

The spirochete appears as a fine, delicate, spiral-shaped organism, appearing as fine, closely and regularly coiled spirals. According to Thompson the organism is 4 to 14 microns long and, according to White and Martin, there are extreme variations in length, from 4 to 24 microns, the usual length being between 7 and 10 microns. The organism is actively motile, being capable of four distinct movements—a rotary motion on the long axis of the spiral, bending of the filament, contraction and extension of its spirals, and a progression through the medium in which it lies (White and Martin).

Its exact biologic position has been a subject of much discussion,

some classifying it as a protozoon; some, as a bacterium; and a third group claim it occupies a position midway between the two.

Monkeys and rabbits have been successfully inoculated.

The *treponema pallidum* may be confused with other organisms; namely, the *spirochæta refringens*, *spirochæta gracilis*, and the *spirochæta dentium*, hence care must be exercised in the search for its presence.

The dark field illumination is the method generally used in examining a fresh lesion. The India ink method is rarely, if ever, used, and the various methods of staining are rather slow in comparison with the dark field illumination.

The cultivation of the spirochete is now possible. Although a few workers had succeeded in growing it the results were not satisfactory until the epoch-making work of Noguchi, as a result of which we are all now able to cultivate the organism successfully.

The organism fulfils the four postulates of Koch. It is obtained from the lesion, it can be cultivated, the culture can be inoculated into animals reproducing typical lesions, and from the lesions so produced the organism can be recovered.

### MODES OF TRANSMISSION

The largest number of cases are acquired by direct contact, and the largest number of these acquire syphilis during copulation. Naturally the largest numbers of chancres are to be found on or about the genitals, so-called genital chancres.

Extragenital chancres are most frequently found around the mouth and are acquired during kissing. Kissing is probably the most frequent method of spreading the disease outside of sexual congress. Two or three persons may be infected in this way from one source.

The finger is another location of the extragenital chancre, and is seen among doctors and midwives, who become infected during the examinations of pregnant women. Doctors have also become infected during the course of a surgical operation. Infections of the fingers have occurred in manicure parlors through the medium of the manicurist's instruments.

Chancres of the lip have been seen following an injury of the lip with a dentist's burr. The use of a fellow-workman's pipe has been another way of transmission. Drinking cups and glasses likewise have come in for their small rôle in transmission.

### IMMUNITY

It is generally recognized that no immunity against syphilis exists, although some individuals may be more susceptible than others. Formerly it was believed that one attack conferred immunity. In the light of our present-day knowledge, this can best be explained from the fact that as long as the *spirochetæ* remain in the body, superinfection is impossible. There are enough cases on record now to prove that a second infection is possible after the patient has been completely cured of his previous attack. Cases of a second infection are becoming in-



creasingly more frequent. It has been claimed that even a third infection is possible. These re-infections are fairly good evidence that the patient has been cured of his previous attack.

Colles' law that the mother of a syphilitic child could not become infected with syphilis because she was immune has been disproved. She cannot become infected with syphilis because she has syphilis. Likewise Profetas' law that a healthy child could not be infected from a syphilitic mother, because the child was immune has been disproved.

### THE WASSERMANN TEST

Shortly after the discovery of the cause of syphilis, Wassermann, Neisser, and Bruck in 1906 discovered a laboratory test for the diagnosis of syphilis that has been called the Wassermann test, and it was the second great stepping stone in advancing our general knowledge of syphilis. This test will stand for all time as one of the most valuable laboratory tests in the entire field of clinical medicine. This is a highly specialized test, one that is exceedingly delicate and one that requires much care and skill in carrying it out. In perhaps no other test does so much depend upon the one who carries it out. So much depends on the outcome of the test that it is one that should be performed only by well-trained, skilled technicians under very careful supervision.

The reaction becomes positive in the primary stage of syphilis. The largest number of positives are obtained in the fourth or fifth weeks of the appearance of the chancre. A single negative reaction in doubtful cases should be repeated, and if there is enough suspicion to warrant it the test should be checked up in a second laboratory. So much depends upon the outcome at this time. If a positive report is wrongly given, a patient may go through the rest of his life carrying a syphilitic burden with all of its worry and with the stigma of syphilis attached to him.

On the other hand, a negative report given a syphilitic gives a false sense of security so that the patient may go on spreading the infection to others and depriving himself or herself of the benefits of modern treatment.

Too much stress should not be laid upon any one laboratory test. So with the Wassermann, which should be considered as one of the symptoms of syphilis, and this taken as part of the gross clinical evidence. A weakly positive test in the absence of a history or other evidence of syphilis should not be taken as final but should be repeated, best perhaps in another reliable laboratory.

A positive Wassermann may be found in diseases other than syphilis. In cases of yaws positive Wassermann reactions have been reported. However, one does not meet with this disease in this part of the globe. It has been claimed that positive Wassermann reactions have been obtained in cases of leprosy. A positive Wassermann may be obtained during the febrile stage of malaria. Positive Wassermanns have been obtained in cases of diabetes, this finding being attributed to the acidosis

associated with diabetes. The positive Wassermanns obtained in diabetics may be due to syphilitic disease of the pancreas.

The Wassermann test becomes negative under the influence of treatment. Craig and Nichols have shown that alcohol (whisky or beer) can render a positive serum negative. The element of time seems to be a factor in some cases. Since the test is influenced by treatment, it is advisable to wait four to six weeks after the last treatment has been given before a test is made.

Wassermann fast is the term applied to those individuals in whom the Wassermann remains positive in spite of long-continued intensive treatment.

Many variations of the original Wassermann technic are now employed.

#### PROVOCATIVE WASSERMANN

In certain cases repeated Wassermann tests may be negative and yet the element of syphilis suspected. In these cases an injection of salvarsan is given and blood for a Wassermann withdrawn every other day for a week. This procedure has resulted in turning a previously negative Wassermann test into a positive one.

#### EXAMINATION OF THE CEREBROSPINAL FLUID

Under certain conditions the blood Wassermann may be negative, whereas an examination of the spinal fluid shows a positive Wassermann. The spinal fluid in paresis is positive in practically 100 per cent. of fully developed paresis and in from 70 to 85 per cent. of cases of tabes dorsalis (locomotor ataxia).

In addition to the Wassermann test on the spinal fluid, the number of cells present in the spinal fluid is determined. The examination should be made at once. From 4 to 10 cells per cubic millimeter are considered normal. The cell count is subject to wide fluctuation. A puncture should not be repeated within ten days.

#### LANGE'S COLLOIDAL GOLD TEST

Lange was able to demonstrate that certain substances in pathologic spinal fluids are capable of causing a precipitation of solutions of colloidal gold. He furthermore demonstrated that this precipitation occurred within definite dilution limits that were practically specific for the syphilitic conditions of the central nervous system, especially tabes and taboparesis (Thompson). Moody and Grulee believe that the curve of paresis is so typical that a diagnosis can be made on this one finding only.

The *luetin test* is practically never used at the present time.

#### CONGENITAL SYPHILIS

Syphilis is one of the common causes of miscarriage, abortion, or still-births. Eventually a full-term babe may be brought into the world which shows signs of syphilis at birth or soon after.

Much interest has always been manifested in the question as to whether the infection is due to a syphilitic father, a syphilitic mother, or both. According to Thompson it would seem that direct paternal infection is impossible, and that congenital syphilis can therefore occur only through an infected mother and this only after conception, either by the carrying of the organisms by the blood through the placenta or by infection from a diseased placenta or finally by direct contact with the syphilitic lesions of the genitals at the time of birth.

### SYPHILIS AND PREGNANCY

This is a most important topic and calls for thorough, energetic, and systematic treatment. (See Chapter on Pregnancy.)

### TREATMENT

The third epoch-making period in the history of syphilis was the discovery by Ehrlich of salvarsan, which followed close upon the isolation of the spirochæta pallida and the elaboration of the Wassermann test. Ehrlich's idea in compounding this drug was to obtain a preparation that would kill all the spirochæta in the body in one injection. In other words, something that would effect a cure in one treatment. In this he failed, although his work has revolutionized the treatment of syphilis.

The discovery of this drug was not by accident. Ehrlich worked with the various combinations of arsenic. Salvarsan was the six hundred and sixth drug that he produced, and as a result of this salvarsan is usually designated by the term "606." He continued his experiments, and later gave to the scientific world a new product which he called neosalvarsan or "914," a drug which possesses advantages over the old salvarsan in that it is more easily administered and the reactions are not as sharp.

During the war the work of Ehrlich was stopped. There have been introduced some new combinations of salvarsan, such as silver salvarsan and copper salvarsan. These, however, have not found universal favor as has the neosalvarsan.

Although salvarsan causes a quick healing of the initial lesions and also a rapid disappearance of the skin lesions, it is believed that salvarsan alone is insufficient in the treatment of syphilis. The present views are that salvarsan or neosalvarsan should be supplemented by some form of mercurial preparation.

### SYPHILIS AND MARRIAGE

This is a very important phase of the subject because of the prevalence of syphilis, and because this disease can be transmitted to the offspring. In some states there are laws requiring one or both the candidates to present certificates regarding their Wassermann tests. In order to make this a more efficient procedure, both the contracting parties should be subjected to a blood-test.

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In the light of our present knowledge it may be stated and quite confidently, I believe, that every case of syphilis can be cured, provided treatment is instituted at once and if the patient conscientiously carries out a definite program of treatment. Most people, unfortunately, discontinue treatment with a disappearance of the symptoms.

In giving consent to marriage, several factors must be taken into consideration: namely, the amount of treatment received, the time which has elapsed since his infection and since his last treatment, and the result of the laboratory tests. If a patient has had thorough treatment, the next procedure would be to determine his blood Wassermann test and, if negative, a spinal puncture should be obtained before consent is given to marriage. Should any of these be positive, treatment should again be instituted and carried through the period of time necessary to render his tests negative. Occasionally one meets with a case in which the patient has had thorough treatment, yet in spite of this his blood Wassermann may remain positive, a condition previously mentioned in this article as "Wassermann fast."

In an individual who has had thorough treatment, who has shown no signs of recurrence, and in whom three years have elapsed since treatment, it is probably safe to give consent to marriage. This must not be construed to mean that any patient with a positive Wassermann should be given consent to marry. This is not the case; it applies to those cases in which many years have elapsed since the patient was infected, in cases where the patient has had an abundance of treatment, and when a long period has elapsed since his last treatment without recurrences having manifested themselves.

# THE MEDICAL JURISPRUDENCE OF LIFE INSURANCE

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LIFE insurance or assurance is a contract which provides that one party, in consideration of a sum paid or to be paid, agrees with another to pay a person for whose benefit the insurance is effected a specified sum at a certain time. The time of payment is contingent upon the death of the insured individual or upon his survival to a certain fixed date.

The document that contains a contract of insurance is called a **policy**. The amount paid or agreed to be paid in one sum or periodically as the consideration for the contract of insurance is known as the **premium**. The party or corporation which contracts, in consideration of the premium, to indemnify an individual or several persons in the event of the completion of the terms of the contract is the **insurer**. The individual whose existence is made the basis of the contract is called the **insured**. The person to whom the insurance is to be paid when the conditions of the contract culminate is known as the **beneficiary**. The contingency insured against by the policy is the **risk**.

At the present time life insurance has for its basis the laws governing the duration of human life, as far as we understand the chances of living or dying during a certain period, combined with the increment of money by interest. Too often the subject of vital statistics is referred to as a science, while as a matter of fact it is but a collection of experiences from which certain deductions have been made. Conservative medicine has interfered with nature's plan for the extermination of the unfit in infancy, and these unfortunates reach adult life and are able to withstand its rigors and increase its death-rate. The depletion of rural population to furnish urban residents affects the mortality-rates of cities, while new inventions and methods entail their tribute of the sacrifice of human life. The fallacies that arise in consequence of these and other causes are recognized, and allowance is made for them in calculating mortality and life statistics; but time is necessary to determine the reliability of this allowance for error. As Dr. Guy has said: "The *sometimes* of the cautious is the *often* of the sanguine, the *always* of the empiric, and the *never* of the skeptic."

Insurance in some of its phases seems to have been an ancient institution. In 1681 an ordinance was issued in France which forbade the insurance of lives, so it may be inferred that the practice was in vogue prior to that date. In 1699 the Mercer's Company established the earliest life insurance association in England; in 1700 the Society

of Assurance of Widows and Orphans was established; and in 1706 a charter was issued for the establishment of the Amicable Society for a Perpetual Assurance Office. The oldest existing life insurance company in the United States is the Presbyterian Ministers' Fund, which was incorporated in Philadelphia January 11, 1759.

In this country life insurance is the business of corporate bodies. These consist of stock companies which pay a certain percentage of their earnings to the stockholders, the balance being allotted to the policy-holders; the amount to be paid to the stockholders is usually specified in the charter, and, as a rule, is 7 per cent. interest on the capital stock, and is a very insignificant portion of the company's income. The officers of these companies are elected by the stockholders.

There are mutual companies in which there is no stock, and consequently there are no stockholders. Every member insured is entitled to an equable share in the profits, and is supposed to have a ruling voice in the management of the company, though as a matter of fact, and probably fortunately for the company, the average policy-holder never aids in the selection of an official during the entire term of his insurance.

There are assessment or natural-premium companies which issue policies, the premiums of which are paid at short intervals, and the premium-rate is increased from time to time until, if the insured and the company survive sufficiently long, the rate becomes virtually prohibitive. The first two classes of companies are known as "level-premium" or "old-line" companies, to distinguish them from the natural-premium companies.

The immense interests involved in life assurance may be appreciated by the statement of the Insurance Commissioner of the State of New York that on January 1, 1902, an aggregate of 38 companies reported \$7,572,802,805 of insurance in force, and their admitted assets amounted to \$1,879,624,564.

**The Medical Examiner.**—It is not within the province of this paper to discuss the various features that pertain to the work of a medical examiner for life insurance. Of the total number of physicians in the United States, probably more than one-half examine for life insurance, and are conversant with the general routine of making an examination.

Unfortunately, it sometimes happens that an examiner is unaware of the importance to the company or to himself of an accurate and painstaking discharge of his duty. There should be virtually no assumption or prerogative to determine what information is essential and what is irrelevant. It is much better to make it a rule to state the facts reported by the applicant and to relegate the onus of determining their import to the insurer's medical department.

The writer had an experience with an examiner who, when he asked the applicant whether he had ever had syphilis, was answered that the applicant did not know. The latter stated that he had been treated for syphilis by a physician some years previously; subsequently he changed his medical attendant, and the new physician told him he did not have



and had not had syphilis, but his symptoms were the result of injudicious medication. The medical examiner asked the applicant a few questions in regard to the symptoms that existed at the time of the venereal infection, and then said to the applicant, in the presence of a witness, "I do not think you had syphilis," and wrote "no" in response to the interrogatory. As the applicant's record was otherwise satisfactory, the company issued the policy applied for. Within three months the insured had an attack of cerebral syphilis, and within nine months he was dead. Had the examiner performed his duty and informed the company of the facts, so that its medical director might determine the import of the history of syphilitic infection, the policy would not have been issued. As it was, the company had no recourse but to pay the death-claim. This is by no means an isolated instance of an examiner discarding important information as immaterial.

As a matter of law, the medical examiner is to be treated as the agent of the company for the purpose of reporting the answers of the applicant.<sup>1</sup> The certificate of the examiner is evidence in its recitals, and it is conclusive unless the opinion of the physician was influenced by fraudulent representations or the concealment of material facts; therefore, in court the company cannot be heard to impeach it, because he is its agent and not an agent of the insured.<sup>2</sup> Consequently the courts have decided that if the applicant gives a correct answer to a question, and the medical examiner changes or omits it because he deems it irrelevant, the company is responsible for the examiner's oversight or indiscretion. The latter opinion, however, is not unanimous, as it has been decided that where a life policy was issued in reliance on a statement contained in the application, which was warranted true, and the statement was false and was written therein by the medical examiner of the company, who was by the terms of the application made the agent of the insured for that purpose, the policy was void.<sup>3</sup>

The foregoing facts are illustrated in a case in which it was proved that in an application for life insurance the insured was asked by the medical examiner, whether he had had any other serious illness than certain diseases specified in the application. After she had told him of an attack of la grippe she had, and of which the examiner was cognizant, he advised the applicant to answer "no" to his last query, which she did. The policy provided that the answers to the medical examiner should be warranties, and that no agent had the power to modify the terms of the contract; but the court held that the company was estopped to assert the falsity of the insured's answer because it was made by the advice of the company's agent.<sup>4</sup>

<sup>1</sup> *Grattan vs. Mutual Life Ins. Co.*, 80 N. Y., 281; 92 N. Y., 274; also *Royal Neighbors of America vs. Boman*, 177 Ill., 27.

<sup>2</sup> *Holloman vs. Life Ins. Co.*, 1 Woods, 674.

<sup>3</sup> *Sternaman vs. Metropolitan Life Ins. Co.*, 63 N. Y. S., 674, 1900.

<sup>4</sup> *Mutual Life Ins. Co. of New York vs. Blodgett*, 27 S. W. Rpts., 286; also *New York Life Ins. Co. vs. Russell*, 23 C. C. A., 43; *Ames vs. Manhattan Life Ins. Co. of New York*, 58 N. Y. S., 244, 1899; *Arnhorst vs. National Union*, 53 N. E., 179 (Illinois, 1899).

Likewise, when the medical examiner, who is authorized to fill up blanks for questions propounded to applicant, or when doing so is within the apparent scope of his duties, does so by writing false answers after the applicant has answered correctly, but without the applicant's knowledge thereof, and then procures the signature of the applicant to such answers, and the company receives the premium and issues the policy, the company is estopped from insisting on the falsity of the answers.<sup>1</sup>

An insurer can take no advantage of a false statement inserted in the application by the medical examiner after it was signed by the applicant, unless the latter consented to, or knew of, such insertion.<sup>2</sup>

An insured sued successfully to have his policy cancelled and his premiums returned because the medical examiner "falsely and fraudulently wrote different answers than those given by the assured to questions concerning his physical condition," etc., and such false answers would have been a defense against the payment of the policy.<sup>3</sup>

But where it can be proved that there was collusion between the examiner and the insured, the company is not bound by the knowledge of its agent, the examiner, who, in drawing the application, fraudulently falsified the insured's answers concerning his health, with the concurrence of the insured, to prevent a rejection of the application.<sup>4</sup>

However, an examiner who would be party to such a fraud would incur the risk of criminal prosecution. Most of the states have laws which provide that "any physician who, as medical examiner for any such company, or as the reference of or medical examiner for any person seeking insurance therein, shall knowingly make any false statement or report to the company, or any officer thereof, concerning the bodily health or condition of any applicant for insurance, or concerning any other matter or thing which might affect the propriety or prudence of granting such insurance, shall be deemed guilty of a misdemeanor, and, on conviction thereof, shall be liable to a fine not exceeding \$1000, or to imprisonment in the county jail not exceeding three months, in the discretion of the court, and he shall also be liable to the company in an action on the case for the full amount of any insurance obtained from such company by means of or through the assistance of such false statement or report."<sup>5</sup>

As is the case with all other penal laws, this is not intended to apply to honest men, but rather to protect them from the odium cast upon them and their profession by such unprincipled individuals as manage to obtain a medical diploma and use it to cloak their nefarious deeds.

The medical examiner's duties are not absolutely limited to the physical examination of the applicant, but include report and information on other subjects relating to the applicant that the company deems

<sup>1</sup> *Providence Savings Life Assurance Society vs. Reutlinger*, 58 Ark., 528; also *Flynn vs. Equitable Life Assurance Society*, 67 N. Y., 500.

<sup>2</sup> *Mutual Reserve Fund Life Assoc. vs. Farmer*, 47 S. W., 850 (Arkansas, 1898).

<sup>3</sup> *Bennett vs. Massachusetts Mutual Life Ins. Co.*, 64 S. W., 758 (Tennessee, 1901).

<sup>4</sup> *Sprinkle vs. Knights Templar and Mason's Indemnity Co.*, 32 S. E., 734 (North Carolina, 1899).

<sup>5</sup> Michigan Revised Statutes, §4235.

essential. This question was decided by the New York Court of Appeals in a case in which there was a misstatement to the medical examiner of the pecuniary position of the applicant and of his relation to the firm with which he was connected. The medical examiner attested that his sole business was to examine the applicant physically, and that he reported the physical condition of the individual and recommended the acceptance or the rejection of the risk. The Court said: "The object of a physical examination of a person proposing to insure his life in an insurance company, by a competent physician, is to ascertain whether he is laboring under, or is subject to, any disease or defect which may have a tendency to shorten life. The inquiry involves an examination not only into the present state of the various organs and functions of the body, but into the tendency of those organs and functions to take on diseases as affected by habits of mind as well as of body, temperament, tendency to disease from hereditary causes, and the occupation and condition in life of the subject. Of two persons of the same age and present bodily health, the one may present a risk entirely safe and proper to be taken, the other unsafe and improper to be taken. It is impossible to affix limits to the subjects into which it is not only proper, but necessary, for an examining physician to inquire in order to arrive at a conclusion upon which he can safely advise the acceptance or rejection of a risk. Whether I am right or wrong in these views, I entertain no doubt that in many cases a knowledge of the pecuniary circumstances of a person desiring to be insured is material to the risk, as affecting in some degree the life; and they are a legitimate subject for the inquiring physician or surgeon. This inquiry may not be material in every case, but the surgeon alone can tell whether it was or was not so in a given case. It is therefore competent to ask him whether he made the inquiry, and what response was given, and how far he deemed such answer material in deciding to advise the taking of the risk. In such cases the very point of inquiry is, whether the pecuniary circumstances were deemed by him material, and whether he would have advised the acceptance of the risk if it had not appeared that the person desiring to be insured was a man of means."<sup>1</sup> The physician who accepts the position of medical examiner owes it, therefore, to the company by which he is remunerated to give it such facts extraneous to the data of family history and physical examination as may afford a comprehensive insight into the moral hazard of the risk.

The proofs of death, which must be submitted to a company in evidence of a death-claim, necessarily include a physician's certificate of the cause of death. In the interest of the beneficiary the physician should answer the questions in the form provided by the company in detail. It was held in an action on a life insurance policy that a physician's certificate of the cause of death offered in evidence by the plaintiff as an admission of all the facts recited therein was an admission only of the cause of death stated.<sup>2</sup> And in another instance it was held

<sup>1</sup> *Valton vs. National Fund Life Assurance Co.*, 1 Keyes, 21.

<sup>2</sup> *Redmond vs. Industrial Benefit Assoc.*, 78 Hun, 104.



that unauthorized statements in a physician's certificate as to the cause of death were inadmissible where the cause of death was the vital issue.<sup>1</sup>

**Professional Confidence.**—The laws of a number of states provide, as do those of New York, that a person duly authorized to practice physic or surgery shall not be allowed to disclose any information which he acquired in attending a patient in a professional capacity.<sup>2</sup> In some states, as well as in the Federal Courts, it has been decided that such provisions apply only in civil actions. In suits against insurance companies it has been held that an attending physician may testify to the fact that the decedent consulted him professionally at certain times and places, but he may not testify as to what he learned at such consultations.<sup>3</sup> As a suit to void a policy would come within the scope of civil actions, a life insurance company might be estopped in its proceedings because the state law forbade an attending physician to make disclosure of information that was obtained in his professional capacity, and such information would be essential to the matter in issue. In order to avoid any legal complication some of the life insurance companies have made a proviso in the contract by which the applicant expressly waives, on behalf of himself and of any person who shall have or claim any interest in any policy issued thereunder, all provisions of law forbidding any physician or other person who had attended or examined him, or who might thereafter attend or examine him in the capacity of a medical attendant, from disclosing any knowledge or information which he thereby acquired.

It has been decided that it is not contrary to public policy to permit an applicant for life insurance to waive the provisions of the legal code which prohibit a physician to testify in regard to communications from his patients, as the knowledge is personal to the patient, and is of no interest to the general public.<sup>4</sup> Such a decision seems to be manifestly in accord with the intent of the law. In the case of the New York statute on this subject, the revisers stated in a note that the law was to enable a patient to disclose his physical condition and history to his physician so as to benefit by his advice without fear of publicity, and that the privilege was solely for the patient's protection and was not intended to keep secret anything that he was willing should be made public.

The courts have also decided that if a beneficiary takes advantage of the information possessed by an attending physician, it cannot subsequently be urged by the beneficiary that such information is privileged.<sup>5</sup>

It is likely that where there is no state law that forbids an attending physician to disclose information acquired in the course of his professional duties, the court would require him to testify to any facts within his knowledge that might be needed in testimony.

<sup>1</sup> *Newdesk vs. Grand Lodge Ancient Order United Workmen*, Am. Dig., 1895.

<sup>2</sup> *New York Code Civil Proceedings*, §834.

<sup>3</sup> *Numrich vs. The Supreme Lodge Knights and Ladies of Honor*, 3 N. Y. Sup., 552; *Breisenmeister vs. Knights of Pythias*, 81 Mich., 525.

<sup>4</sup> *Dougherty vs. Metropolitan Life Ins. Co.*, 33 N. Y. S., 873, 87 Hun, 15.

<sup>5</sup> *Proppe vs. Metropolitan Life Ins. Co.*, 34 N. Y. S., 172.

Necessarily, any disclosures made by an applicant to an examiner are exempt from the provisions of such a law, because the examiner is the medical agent of the company and not the professional attendant of the applicant, and the knowledge possessed by the agent is knowledge that is at the service of the principal. Furthermore, the explicit record, in the application, of any and all disqualifications, such as family history or personal disease at some prior state, will preclude any possibility of such disqualifications being advanced as the basis to void the policy.

### APPLICATION

It is the rule in the United States that the contract of life insurance is not entered into until the applicant has submitted a formal written application which gives the following personal data: the name, residence, address, occupation, date and place of birth, social condition, amount of insurance in force on the individual's life, previous rejection or postponement of an application from the party in question by any company, the amount and kind of insurance desired, the beneficiary, the former health of the applicant, especially in regard to certain specified diseases, the applicant's habits in regard to the use of liquors and narcotics, the family history, and the results of a personal medical examination.

The applicant warrants the truth of his answers; as a rule, he agrees that the application shall be the basis for and part of the contract, and, further, that he will not reside in certain localities or engage in certain occupations, and he also agrees to certain other conditions. When the application for a policy of insurance is not made a part of the contract between the parties, and the policy contains no warranty of the truth of the statements in the application, both the materiality and falsity of the statements of the assured must be shown in order to defeat an action on the policy.<sup>1</sup>

From the information contained in the application, and relying upon its correctness, the company does or does not enter into the contract. The application is filled out in part by the agent who has canvassed the applicant, and in part by the medical examiner who makes the physical examination. It has been decided that "where a policy contains a provision that 'in consideration of the statement of facts warranted to be true in the application for this policy, and of the payment' of certain sums, the company 'hereby insures,' etc., the application referred to is part of the contract of insurance."<sup>2</sup> However, in case of conflict between the provisions of a policy and the statements in the application for insurance the former will control.<sup>3</sup>

A matter of interest is the status of the applicant, pending the insurer's action on the application.

An insurance company is not liable when the application provides

<sup>1</sup> Fidelity and Casualty Co. of New York *vs.* Alpert, 14 C. C. A., 474.

<sup>2</sup> Standard Life and Accident Ins. Co. *vs.* Martin (Ind. Sup.), 33 N. E., 105; also Parish *vs.* Mutual Benefit Life Ins. Co., 49 S. W., 153.

<sup>3</sup> Goodwin *vs.* Provident Saving Life Assurance Society (Iowa), 66 N. W. R., 157.

that there shall be no liability until it is approved and accepted, and the applicant dies pending its consideration. The Chief Justice of the Supreme Court of Mississippi, in a final judgment, said: "There is no escape from the plain stipulation of the contract 'that, if said application is not approved and accepted, said company shall incur no liability thereunder,' and also from the fact that said application was not approved and accepted, as the applicant died while the company was considering the application. It had incurred no liability and cannot be held bound as if it had. . . . The denial of all liability by the company, on the facts of this case, does not need the support of adjudications, and we have not examined any, preferring to rest with perfect confidence on the unmistakable meaning of the written agreement, which no number of books or extent of ingenious argument could change so as to create liability, except of the terms it expresses."<sup>1</sup>

The care essential in formulating the phraseology of the application is shown by the following decision: A life insurance policy referred to certain provisions, conditions, and agreements on the back thereof, which were made a part of the contract. One of the provisions was that any breach of warranty or untrue statement in the application should void the policy, and another was that "the contract for insurance is contained only in this policy and the application therefor (which is part hereof) taken together." The paper designated as the application stated only "that the entire contract is contained in said policy and this application." On the back of the application, under the caption "Declaration to be Made to the Medical Examiner," were questions and answers which referred to the "foregoing application." It was held that such questions and answers were not a part of the application, and therefore the answers were not warranties, but were mere representations.<sup>2</sup> This brings forward the important question of warranty and representation.

**Warranty and Representation.**—The statements in all applications are to be classed under one of two heads, warranties or representations. An excellent idea of the legal distinction between these is afforded by the following decision:

"A warranty in insurance enters into and forms a part of the contract itself. It defines by way of particular stipulation, description, condition, or otherwise, the precise limits of the obligation which the insurers undertook to assume. No liability can arise except within those limits. In order to charge the insurers, therefore, every one of the terms which define their obligation must be satisfied by the facts which appear in the proof. From the very nature of the case the party seeking indemnity or payment under the contract must bring his claims within the provisions of the instrument he is undertaking to enforce. The burden of proof is upon the plaintiff to present a case in all respects conforming to the terms under which the risk was assumed. It must

<sup>1</sup> *Jacobs vs. New York Life Ins. Co.*, Supreme Court of Mississippi, Feb. 19 1894.

<sup>2</sup> *Boehm vs. Commercial Alliance Life Ins. Co.*, N. Y., 9 Misc. Reports, 529.



be not merely a substantial conformity, but exact and literal, not only in material particulars, but in those that are immaterial as well.

"Representation is, on the other hand, in its nature, no part of the contract of insurance. Its relation to the contract is usually described by the term "collateral." It may be proved, although existing only in parole and preceding the written agreement. Unlike other verbal negotiations, it is not merged in nor waived by the subsequent writing. . . . Representations to insurers before or at the time of making a contract are a presentation of the elements upon which to estimate the risk proposed to be assumed. They are the basis of the contract, its foundation, on the faith of which it is entered into. If wrongly presented, in any respect material to the risk, the policy that may be issued thereupon will not take effect. To enforce it would be to apply the insurance to a risk that was never presented. . . . When statements or engagements on the part of the insured are inserted or referred to in the policy itself, it often becomes difficult to determine to which class they belong. If they appear on the face of the policy, they do not necessarily become warranties. Their character will depend on the form of expression used, the apparent purpose of the insertion, and sometimes upon the connection or relation to other parts of the instrument. If they are contained in a separate paper, referred to in such a manner as to make it a part of the contract, the same considerations, of course, will apply; but if the reference appears to be for a special purpose, and not with a view to import the separate paper into the policy as a part of the contract, the statements it contains will not thereby be changed from representations into warranties. It is perhaps needless to add that verbal representations can never be converted into warranties otherwise than by being afterward written into the policy.

"In considering the question whether a part of the contract is a warranty, it must be borne in mind as an established maxim that warranties are not to be created nor extended by construction. They must arise, if at all, from the fair interpretation and clear intendment of the words used by the parties. . . .

"The application is in itself collateral merely to the contract of insurance. Its statements, whether of facts or of agreements, belong to the class of representations. They are to be so construed, unless converted into warranties by force of a reference to them in the policy, and a clear purpose is manifested in the papers thus connected that the whole shall form one entire contract. When the reference to the application is expressed to be for another purpose, or when no purpose is indicated to make it a part of the policy, it will not be so treated."<sup>1</sup>

This opinion of the Massachusetts court is more tersely expressed in a Minnesota decision:

"So far as the questions presented by the case at bar are concerned, it is sufficient to define a warranty in insurance to be a part of the contract evidenced by the policy, and a binding agreement that the facts stated are strictly true. A representation in insurance may, for the pur-

<sup>1</sup> *Campbell vs. New England Mutual Life Ins. Co.*, 98 Mass., 381.

pose of this case, be defined to be a statement in regard to the material fact made by the applicant for insurance to the insurer with reference to a proposed contract of insurance. As representations simply, they are not a part of the contract of insurance, and though expressly referred to in the policy so as to become a part of the written contract, they may not become warranties. And even if it be made by the very terms of the policy, as in the case at bar, an express condition of the contract of insurance that if such representations are found to be untrue the policy shall be null and void, they do not necessarily lose their character as representations and become warranties, though the effect of such express condition may be to make them conclusively material.

"It is sufficient if representations be substantially true, while a warranty must be strictly complied with. A false warranty therefore avoids a policy, while a false representation (not fraudulent) does not avoid a policy, unless it relates to something which is material in fact or is made material by the contract of the parties. Warranties then are conditions precedent, so that their truth must be pleaded by the insured, upon whom, of course, the burden of proving the same rests; whereas the falsity of representations is matter of defense to be pleaded by the insurer."<sup>1</sup>

The English courts have taken the position that when the policy declares that the statements in the application are the basis of the contract, it amounts to a warranty, and the literal truth of such statements, whether material or not, must be established. They hold that a misstatement in a warranty is fatal, although arising from the most innocent mistake, or from false information afforded by others, or from mere inadvertence, and without regard to the fact as to whether it was a material inducement to enter into the contract or not.<sup>2</sup> In some instances this severe ruling has held in the United States, as in the cases just cited.<sup>3</sup>

It has been decided that when an application states that "I do hereby warrant the truthfulness of the statements in this application, and consent and agree that any untrue or fraudulent statement made therein" shall forfeit all rights under it, the statements contained therein are warranties.<sup>4</sup> Another decision held that only such statements as are strictly in answer to inquiries contained in the application for life insurance can be regarded as warranties.<sup>5</sup>

Having this definite basis on which to determine what constitutes a warranty, it is evident that where the insured warrants the truth of the answers in the application, compliance with the warranty is a condition of the contract, and any substantial deviation from the truth is material to the risk and avoids the policy.<sup>6</sup>

<sup>1</sup> *Price vs. Phoenix Mutual Life Ins. Co.*, 17 Minn., 497.

<sup>2</sup> A. Scratchley, *A Practical Treatise on Life Assurance Societies*, London, 1890.

<sup>3</sup> *Schwartz vs. Berkshire Life Ins. Co.*, 91 Ill. App., 494 (Illinois, 1900).

<sup>4</sup> *Foley vs. Royal Arcanum*, 78 Hun, 222.

<sup>5</sup> *Federal Life Assoc. vs. Smith*, 86 Ill. App., 427, 1899.

<sup>6</sup> *O'Shaughnessy vs. Working Women's Co-operative Association of United Insurance League of New York*, 8 Misc. Rpt., N. Y., 491. *Kelley vs. Mutual Life*, 75 Fed. Rep., 637; *Aloe vs. Mutual Reserve Fund Life Assoc.*, 147 Mo. Rpt., 561.

It has been decided that when the certificate of insurance provided that the application and the medical examination were a part of the contract and should be deemed warranties, a breach of a statement made therein avoided the contract.<sup>1</sup> And it has been held that when the insured warrants statements in the application to be true, an untrue statement is a breach of warranty, and it is immaterial whether or not the insured knew that it was untrue.<sup>2</sup>

Thus it would appear that the matter was definitely settled from these standpoints, that the application and medical examination did form part of the contract, and it could not be urged as a defense that the insured did not know the warranty was untrue. In a rare instance the court has even gone farther and held that when an application contained a warranty of the truth of all the answers to questions therein, and stated that the person taking the application should be the agent of the applicant as to all statements and answers, a false statement would avoid the policy, though made by the person writing the application.<sup>3</sup>

On the other hand, it has been held that when neither a policy of life insurance nor the application contained a stipulation that a breach of a warranty in the application should nullify the policy, such breach rendered the policy voidable but not void.<sup>4</sup>

Statements made by an applicant for membership in a mutual benefit association in answer to questions addressed to him in connection with his application are representations only, and not warranties; and the court properly refused an instruction that the falsity of "any one" of such answers would prevent recovery, as the materiality of the answer and fraudulent intent should be considered.<sup>5</sup>

That a fact is inquired about specifically shows that the insurer regards it as material, and if a misrepresentation is made, the contract is likely to be held void.<sup>6</sup> But where the evidence conflicts it will be a question for the jury to determine whether the answer was true or not. The Supreme Court of the United States decided<sup>7</sup>: The principal defense set up at the trial was that in the application for insurance false answers had been given to the questions propounded by the defendants. Those questions were in substance, whether the person whose life was proposed for insurance had had certain diseases, or, during the next preceding seven years, any disease, and the answers given were that he had not. It was in reference to this that the court instructed the jury that it was for them to determine from the evidence whether the person whose life was insured had, during the time mentioned in the questions

<sup>1</sup> Knudson *vs.* Grand Council of New Legion of Honor, South Dakota, Am. Dig., 1895.

<sup>2</sup> Elliot *vs.* Mutual Benefit Life Assoc., 76 Hun, 378; Bernard *vs.* United Life Assoc., 8 Misc. Rep., N. Y., 499.

<sup>3</sup> Bernard *vs.* United Life Ins. Assoc., 8 Misc. Rep., N. Y., 499.

<sup>4</sup> Selby *vs.* Mutual Life Ins. Co. of New York; Phinney *vs.* Mutual Life Ins. Co. of New York, Am. Dig., 1895.

<sup>5</sup> Perine *vs.* Grand Lodge Ancient Order United Workmen (Minn.), 53 N. W., 367.

<sup>6</sup> Connecticut Mutual Life Ins. Co. *vs.* Young, 77 Ill. App., 440.

<sup>7</sup> Manhattan Life Ins. Co. *vs.* Francisco, 17 Wallace, 672.



propounded on making the application, any affliction that could properly be called a sickness or disease, within the meaning of the term as used; and said, "for example, a man might have a slight cold in the head, or a slight headache, that in no way seriously affected his health or interfered with his usual avocations, and might be forgotten in a week or a month, which might be of so trifling a character as not to constitute a sickness or a disease within the meaning of the term as used, and which the party would not be required to mention in answering the questions. But, again, he might have a cold or a headache of so serious a character as to be a sickness or disease, in the meaning of those terms as used, which it would be his duty to mention, and a failure to mention them would make his answer false. There is no just ground of complaint in this instruction, either considered abstractly or in its application to the evidence in the case."

Bliss<sup>1</sup> held that where an answer was untrue, the jury had no right to say that the variation from the truth was as to a matter not material, and by way of example he said that where the answer was that the insured had had no disease of or injury to any organ, and it was shown that he had had a disease of or injury to the eyes, it was held that the policy was void, though the affection of the eyes was several years previous, and was not shown to have affected his general health. So as to the names of medical men who have ever attended him. An omission in this respect is fatal.<sup>2</sup>

The burden of proof is on the insurer to show the untruthfulness of an answer made by the insured in his application.<sup>3</sup> In order to give the assured all possible protection, state legislation has provided that no oral or written misrepresentation made in the negotiation of a contract or policy of insurance by the assured or in his behalf shall be deemed material, or defeat or avoid the policy, or prevent its attaching, unless such misrepresentation is made with the actual intent to deceive; or unless the matter misrepresented increased the risk of loss.<sup>4</sup>

It has been decided that a clause in the policy which waives such a law is not binding on the assured or the beneficiary. "The act of June 23, 1885, which provides that no untrue statement in an application for a life insurance policy, if made in good faith, shall work a forfeiture or be a ground of defense unless it relate to a matter material to the risk, is of binding effect, though assured in his application expressly agreed that every statement shall be material, and that any misstatement shall avoid the policy, notwithstanding any law to the contrary."<sup>5</sup>

There is a great difference of opinion in regard to the effect of misrepresentation made by the agent who writes the answers to the questions propounded to the applicant. When, in reply to a question, an applicant for life insurance states the facts fully, and the agent of the

<sup>1</sup> The Law of Life Insurance, p. 71.

<sup>2</sup> Metropolitan Life Ins. Co. *vs.* Rutherford, 35 S. E., 719; Ins. Co. *vs.* Gilbert, 27 Mich., 429; Cerys *vs.* Ins. Co., 71 Minn., 638; Graham *vs.* Ins. Co., 87 N. Y., 69.

<sup>3</sup> Jefferson *vs.* German-American Life Assoc., 69 Mo. App., 126.

<sup>4</sup> Mass. Stat., Sec., p. 21.

<sup>5</sup> Hermany *vs.* Fidelity Mutual Life Assoc., 151 Pa. St., 17.

company, authorized to ask the question and write the answer, deduces and writes down an erroneous answer in consequence of putting his own construction on such facts, and assures the applicant that it is the proper answer to the facts stated and that it is the answer the insurer wants, then the insured is not precluded by his warranty from showing the circumstances under which the answer was made. When so shown the insurer is estopped from questioning the truth of the answer. The same rule obtains when the applicant answers fully and truthfully, and the agent of the insurer, charged with the duty of asking the questions and writing the answers, abbreviates an answer or omits part of it.<sup>1</sup>

The majority of decisions of this question have held that where an applicant for life insurance truthfully answers the questions in his application, and the agent, intentionally or negligently, writes down a different answer, the insurer cannot defend an action on the policy by showing the untruthfulness of the answers which were made warranties.<sup>2</sup>

At variance with these, and holding the insured responsible for oversight or carelessness in his application, is the following decision: If an application for a policy of insurance on the life of a person provides that the representations and answers made therein "shall form the basis and become part of the contract of insurance," and "that any untrue answers will render the policy null and void," and the policy recites that it is issued "in consideration of the representations and agreements in the application for this policy, which application is referred to and made a part of this contract," in an action upon the policy the application is to be considered a part of the contract, and if the representations in it are in a material respect untrue, the action cannot be maintained, although the untrue representations were inserted in the application by the agent employed by the defendant to solicit insurance, without the knowledge of the applicant, who orally stated the truth to the agent.<sup>3</sup>

Of course, the decisions cited do not hold the company responsible in case there was collusion between the company's agent or the examiner and the applicant, as was held in a case where the agent of an insurance company entered into a conspiracy with an applicant for a life policy to insert false statements in the application, and thereby induce the company to issue the policy. The court held that he ceased to be the company's agent and became the agent of the applicant, and the company could not be held responsible with notice of the facts known to such agent.<sup>4</sup>

From the trend of these decisions it is seen that the tendency of courts is to hold to the explicit terms of the contract in matters that are

<sup>1</sup> *Mutual Benefit Life Ins. Co. vs. Robinson*, 58 Fed. Rept., 723.

<sup>2</sup> *Muller vs. Union Cent. Life Ins. Co.*, 7 Kulp, 422; *Robinson vs. Metropolitan Life Ins. Co.*, 37 N. Y. Sup., 146; *Corbett vs. Metropolitan Life Ins. Co.*, 30 N. Y. Sup., 1069; *O'Brien vs. Home Benefit Soc.*, 22 N. Eng. Repts., 954; *Baker vs. Home Life Ins. Co.*, 64 N. Y., 648; *Conn. Mut. Ins. Co. vs. Wilkinson*, 13 Wall., 222; *Foot vs. Aetna Life Ins. Co.*, 4 Daly, 285; *Swisk vs. Home Life Ins. Co.*, 2 Dillon, 160; *O'Rourke vs. John Hancock Mut. Life Ins. Co.*, 30 N. Y. S., 215; *Endowment Rank Knights of Pythias vs. Rosenfield*, 22 S. W. Repts., 204.

<sup>3</sup> *McCoy vs. Metropolitan Ins. Co.*, 133 Mass., 82.

<sup>4</sup> *Centennial Mutual Life Assoc. vs. Parham*, 80 Tex., p. 518.

of essential importance for the information of the insurer. The medical examiner may therefore appreciate the necessity of impressing the applicant with the need of frank answers to the interrogatories. The writer was about to examine a physician for insurance, and in some preliminary conversation the applicant said he had some diseases but intended to allow the examiner to detect them, if possible. The applicant's attention was directed to the fact that he had to reply to questions in regard to the past existence of organic and constitutional diseases, and that his replies were warranties. The significance of a warranty was explained to him, and he then said it would be futile to make the examination, as he was under treatment for diabetes and had an obscure organic heart disease.

Unanswered questions in an application are no part of the insurance contract,<sup>1</sup> and it is essential, therefore, that the examiner should assure himself by careful rereading of the examination that he has left no question unanswered.

**Residence.**—The residence of the applicant is a matter of importance because unsanitary or other endemic conditions are likely to shorten life, and a company either declines business from such a place or it charges a higher premium to compensate for the increased risk. Many insurance contracts provide that the insured can reside and travel only within the United States, Canada, Mexico, and Europe, while a few specify that the insured must not reside south of the thirty-second parallel of north latitude during any part of the months of July, August, September, or October, thus excluding that portion of the United States that has been so frequently subjected to epidemics of yellow fever. Some companies impose no restriction on residence or travel. Coincident with the general improvement in sanitary conditions throughout the civilized world, the companies are less rigorous in introducing this proviso to restrict the territory in which the insured is allowed to reside.

In a case in which the policy provided that between July 1st and October 15th the insured must reside within certain specified states, unless he was granted a permit to travel elsewhere, the court decided that the policy was void because the insured died in one of the proscribed states during the prohibited season.<sup>2</sup>

In a case quoted by Bliss<sup>3</sup> the insurer claimed that there was a materially false representation as to the residence of the insured. She was correctly described as a resident of a certain place, but no mention was made of the fact that she was a prisoner in the county jail at that place. The court held that although there was nothing expressly specified that required the imprisonment to be stated in the application, and although there was no omission of any information that the insurer called for, still if the imprisonment was a material fact its concealment would be fatal, and it was for the jury to determine the materiality of the conceal-

<sup>1</sup> *Brown vs. Greenfield Life Assoc.*, 53 N. E., 129 (Mass., 1899).

<sup>2</sup> *Nightingale vs. State Mutual Life Ins. Co.*, 5 R. I., 38.

<sup>3</sup> *Op. cit.*, p. 179.



ment.<sup>1</sup> Certainly in this instance the medical examiner failed to appreciate the responsibility of his office, or he would have reported the fact.

**Occupation.**—The greater mortality which affects those who follow certain vocations has made it necessary for the insurer to know the occupation of the applicant.

There is no fixed rule in regard to the vocations which are prohibited by the companies, although almost all exclude blasting, mining, aëronautic or submarine operations, the manufacture, handling, or transportation of explosive substances, employment on or about any moving railway cars or engine, or on any ship or boat, or military or naval service in time of war. Some companies specify that the excluded vocations include members of a paid fire or police department, those who handle electric wires or dynamos, those who work on cable or electric cars, hotel proprietors who tend bar, and gamblers. Other companies, while they do not specifically publish that those engaged in these hazardous vocations will not be accepted as risks, either decline the application or issue the policy at an increased premium-rate which will compensate for the hazard of the occupation.

When the truth of the facts stated in an application for life insurance, which is made part of the policy, is warranted by the application, a false statement as to the applicant's business will avoid the policy though the nature of his business had nothing to do with his death.<sup>2</sup>

In the Dwight case the applicant stated that he was a real estate and grain dealer and was not engaged in the manufacture or sale of any beer, wine, or other intoxicating liquor. The testimony proved that Dwight was engaged in keeping a hotel at the time he stated he was in the real estate business, that he regularly and systematically sold wines and liquors in bottles of various sizes, bearing the name of his hotel blown in the glass. He paid the state and national government for licenses to enable him to carry on the business of selling beer, wines, and liquors at retail, to be drunk upon his premises, although he kept no bar and did not sell to persons who were not his guests. The court was of the opinion that the answers of the insured to the questions relating to his business and occupation were evasive and untrue, and upon the whole evidence required the dismissal of the complaint.<sup>3</sup>

An individual who was insured had stated in his application that his occupation was that of farmer, and it was proved that his real business was to catch fugitive slaves. The court held that the policy was avoided, as it was proved that slave-catching was a more hazardous employment than farming.<sup>4</sup>

In another instance of misrepresentation of occupation the court held that "the inquiry as to his vocation was what it then was and what it had been. His answer *traveling agent* was true as to what it then was, but untrue as to what it had been; for the inquiry as to his

<sup>1</sup> Huguenin *vs.* Rayley, 6 Taunt., 186.

<sup>2</sup> Lovell *vs.* Royal Arcanum, 30 N. Y. S., 205.

<sup>3</sup> Anna W. Dwight et al. *vs.* The Germania Life Ins. Co., 1886, New York, Rep., 103; also Malicki *vs.* Chicago Guaranty Fund Life Assoc., 50 F., 390.

<sup>4</sup> Hartman *vs.* Keystone Ins. Co., 21 Pa. St., 466.

past vocation obviously called for the statement that it had been a *painter* and a *soldier*, as well as a traveling agent. The answer was false from the clear and manifest failure to tell the whole truth."<sup>1</sup>

From time to time examiners have the experience of efforts made by applicants to misrepresent their actual vocation, and companies are undoubtedly saved the expense and annoyance of postmortem litigation by timely information in regard to the real occupation of the applicant.

**Race.**—It is a generally known fact that vital statistics have demonstrated that the mortality of negroes is greater than that of whites, and the mortality rate of mulattoes is even greater than that of persons of pure negro blood; usually the negro is less well informed in regard to his family record than is the average white person. On these accounts it is essential for the medical examiner to investigate the question of ancestry carefully when there is suspicion of mixed blood.

There are laws that provide that no life insurance company doing business within a state shall make any distinction or discrimination between white persons and colored persons, wholly or partially of African descent, as to the premiums or the rates charged for policies upon the lives of such persons, or in any other manner whatever; nor shall any such company demand or require a greater premium from such colored persons than is at that time required by such company from white persons of the same age, sex, general condition of health, and prospect of longevity.<sup>2</sup> Consequently the companies do not discriminate against negroes, but depend upon the warranty for correct information in regard to the race to which an applicant belongs and judge each application on its merits.

**Age.**—As the premium-rate is based on the expectation of life at each age, it is a matter of prime importance that the correct age be stated in the application. Furthermore, the liability to certain diseases decreases after thirty, as it increases after forty in regard to some other diseases, and these facts are duly weighed by the insurer when considering the acceptance of a risk. The writer agrees with Dr. Winston and Dr. Marsh<sup>3</sup> "that age is not the main element in determining the cause of death, but that the medical selection is more important on account of some well-marked exceptions to the rule of diseases as affected by age alone." Their investigations showed that the causes of death at early ages and during the first years of insurance and those of advanced life and after many years of insurance are almost exactly the same. It is easy to understand that an understatement of an applicant's age increases the risk, as a matter of law.<sup>4</sup>

As a rule, the age is made a matter of warranty, and a statement in the application that the insured was younger than he really was avoids the policy.<sup>5</sup>

<sup>1</sup> Fitch *vs.* American Pop. Life Ins. Co., 2 N. Y. Sup. R., 247.

<sup>2</sup> C. 119, Acts N. Y., 1891.

<sup>3</sup> Mortuary Experience Mutual Life Ins. Co., N. Y., 1877.

<sup>4</sup> Dolan *vs.* Mutual Reserve Fund Life Assoc., 53 N. E., 1898.

<sup>5</sup> Schmitt *vs.* National Life Assoc., 84 Hun, 128; Hanford *vs.* Association, 122 Nev.; Aetna Life Ins. Co. *vs.* D. France, 91 U. S., 510.

An insurance company defended payment of a policy in which the statements in the application were warranties, and entitled the company to declare a forfeiture if they were untrue. An insured had stated that her age was fifty-one, that she was born in 1846. The company introduced in evidence a baptismal record made where her parents lived, according to the canons of the Protestant Episcopal Church, which stated that a child having the same name as the insured and parents with the same names as her parents was born in 1837. According to the undisputed evidence of a granddaughter of the insured, if born in 1846 she would have been a grandmother at twenty-seven. *Held*, that the *prima facie* case established by the baptismal record and other evidence was not overcome by the testimony of a physician, based on an acquaintance of three or four years, that he believed her to be about the age stated in the application, and hence the denial of a motion to direct a verdict in favor of defendant, on the ground of breach of warranty as to age, was erroneous.<sup>1</sup>

When the applicant states his age correctly or answers that he does not know what it is, and the person who fills out the application inserts a younger or supposititious age, the insurer cannot plead a breach of warranty.<sup>2</sup>

In compliance with legal requirements in some states and in consequence of more liberal terms in the contract, most policies provide at the present time that in the event of understatement of age the amount payable on the policy shall be the insurance which the actual premium paid would have purchased under the same table of premiums at the true age at the date of the application. In affirming a judgment secured by A. Singleton against the Prudential Insurance Company, the third Appellate Division held, in an opinion by Justice Landon, that where a policy of insurance provided that "in case the age of the insured shall have been understated by mistake, the sum insured will be reduced to the amount the premium would pay for at the true age," a mistaken understatement of his age by the insured is not a fatal breach of a clause of the policy which made the answers warranties.<sup>3</sup> It is not likely that a company would urge any breach of warranty in such a case unless there was some associated suspicious feature, but the court's decision accords with the usual custom when such errors occur.

**Social Condition.**—The applicant is asked whether he is married or single, because vital statistics have proved that those who are married average a longer duration of life than those who are single. This is notably the case with women who have successfully passed the perils of childbirth, to which any young single woman is exposed because of the possibility that she will marry.

A case occurred in which a policy was issued on the basis of good faith in the answers given in the application. In the latter the appli-

<sup>1</sup> Hartshorn *vs.* Metropolitan Life Ins. Co., 67 N. Y. S., 13 (New York, 1900).

<sup>2</sup> J. Miller *vs.* The Phoenix Mutual Life Ins. Co., 170 N. Y., 292; Morrison *vs.* Life Ins. Co., 59 Wisc., 162.

<sup>3</sup> 42 N. Y. Sup., 446; also Egan *vs.* Supreme Council Catholic Benevolent Legion, 57 N. E., 1109 (New York, 1900).



cant, when asked whether he was married or single, answered that he was single, although in fact he was married and his wife was alive. The insurer made this false answer one of the grounds to resist the payment of the policy. The beneficiary pleaded that when the insured falsely answered that he was single, he made himself a less eligible candidate for insurance than if he had truly stated that he was a married man; that although he deceived the company and caused it to enter into a contract that it did not intend to make, it was deceived to its advantage, and made a more favorable bargain than was supposed. The court held that such argument was bad morality and bad law; that no man was justified in the utterance of a falsehood, which was an equal offense in morals whether committed for personal benefit or for the benefit of another. Such a statement under such circumstances constituted a breach of warranty and the policy was void.<sup>1</sup> Other factors existed in this particular case to justify so severe a construction of the law of warranty.

Another reason that makes it desirable that the answer to this question should be made a warranty is that an applicant who is living in a state of concubinage, though perhaps the fact was unknown generally in the community in which he lived, would have a moral hazard that would depreciate his value as a desirable risk.

**Beneficiary.**—The beneficiary is the person or persons specified in the policy to whom the sum insured for is to be paid in the event that the policy should become a claim for liquidation.

There have been great diversity of opinion and considerable litigation in regard to what constituted an insurable interest, and in some states legislation has been enacted to define this question. The Supreme Court of the United States held: "The better opinion is that the decided cases which proceed upon the ground that the insured must necessarily have some pecuniary interest in the life of the *cestui que vie*, are founded in an erroneous view of the nature of the contract; that the contract of life insurance is not necessarily one merely of indemnity for a pecuniary loss, as in fire and marine policies; that it is sufficient to show that the policy is not invalid as a wager policy, if it appears that the relation, whether of consanguinity or of affinity, was such between the person whose life was insured and the beneficiary named in the policy, as warrants the conclusion that the beneficiary had an interest, whether pecuniary or arising from dependence or natural affection in the life of the person insured. Insurers, in such a policy, contract to pay a certain sum in the event therein specified, in consideration of the payment of the stipulated premium or premiums, and it is enough to entitle the insured to recover, if it appears that the stipulated event has happened, and that the party effecting the policy had an insurable interest, such as is described, in the life of the person insured at the inception of the contract."<sup>2</sup>

While it is not within the province of this paper to consider the

<sup>1</sup> Jeffries *vs.* Economical Life Ins. Co., 22 Wallace, 47.

<sup>2</sup> Phoenix Mutual Life Ins. Co. *vs.* Bailey, 15 Wallace, 616.

legal relations of the insured and the beneficiary, this brief reference has been made so that the medical examiner may know that he should inform the company when he knows that there is no insurable interest, as a wager policy—that is, a policy in which insurance is effected by or for a beneficiary who has no interest in the life of the insured—is void.

**Existing Insurance.**—For various and principally for business reasons the applicant is asked whether he has, at the time he makes the application, any insurance on his life in any company, association, society; or order granting life insurance, and when it was taken out, as well as the amount of the policies.

In the case of *Jeffries vs. the Economical Life Insurance Company*, heretofore referred to, the applicant answered that he had not made application to any other company, although it was subsequently proved that he had done so and had effected insurance on his life. The court said: "The company deems it wise and prudent that the applicant should inform them truly whether he has made any other application to have his life insured. So material does it deem this information that it stipulates that its liability shall depend upon the truth of the answer. . . . The company fixes the estimate of its importance. The applicant agrees that it is thus important by accepting this test. It would be a violation of the legal rights of the company to take from it its acknowledged power thus to make its opinions the standard of what is material, and to leave that point to the determination of a jury. . . . Whether a question is material depends upon the question itself. The information may be immaterial. But if under any circumstances it can produce a reply which will influence the action of the company, the question cannot be deemed immaterial. Insurance companies sometimes insist that individuals largely insured upon their lives, who are embarrassed in their affairs, resort to self-destruction, being willing to end a wretched existence if they can thereby bestow comfort upon their families. The juror would be likely to repudiate such a theory, on the ground that nothing can compensate a man for the loss of his life. The juror may be right, and the company may be wrong. But the company has expressly provided that their judgment, and not the judgment of the juror, shall govern. Their right thus to contract, and the duty of the courts to give effect to such contracts, cannot be denied."

This decision is very important because it recognizes that a man who is overwhelmed by business or other trouble may see in suicide a release from his cares, while he would perceive that to effect heavy insurance would provide financially for those who were dependent on him.

One who has insured in good faith can have no objection to inform a company of all the existing insurance on his life, while a person who conceals such facts is likely *ipso facto* to have some suspicious motive in such action.

If applications are made contemporaneously or within a short time of each other, a statement that no application has been made to any other company for insurance has been held to be material, and, if false,

constitutes a breach of warranty that the answers to the questions in the application are true.<sup>1</sup>

The medical examiner may be cognizant that, inadvertently or otherwise, an applicant has omitted to report the existence of insurance in force. In such cases it would be well to apprise the company of the facts. And in the event that the examiner knows an applicant is unable to carry the insurance he has, in addition to that he applies for, he would further the interest of all parties concerned by making a confidential report to the company in regard to this matter. That such a report is within the scope of the examiner's duties is shown in the section on the Medical Examiner (see page 1097).

**Previous Rejection.**—It is a common experience in all companies that however indifferent an individual may be to insure his life, when he has been rejected as a desirable risk he becomes solicitous for insurance and will apply to some new company and frequently conceal the fact of his previous rejection. It has been decided that when an application for insurance, which is made a part of the policy, stipulates that the answers to the questions propounded are warranted by the insured to be true, and that the rights of the insured shall be forfeited if any untrue or false statements shall be made, the policy is avoided by a false answer to the question whether the insured had ever been rejected by any other life insurance company.<sup>2</sup> Judicial interpretation of the duty of an applicant has gone farther, as it has been held that a false answer by an applicant for life insurance as to whether any physician has ever given an unfavorable opinion on his life in reference to insurance is a material representation.<sup>3</sup> It may thus be seen that the courts place a very strict construction on this question of prior rejection, as it is a most material fact for consideration in the determination of an individual's eligibility.

In a long-contested case the facts were proved that an agent had taken an application to an examiner's office, but had not found the physician at home. At a later hour the agent met the examiner and mentioned his visit, whereupon the doctor said it would be useless to examine the applicant, as he was a bad risk and would not pass. After this information the agent dropped the matter and destroyed the application. Subsequently the applicant sought insurance in another company, made warranty that he had always been accepted when he applied for insurance, and on the basis of this warranty a policy was issued. When the insured died, the insurer learned the facts in regard to the prior effort to secure insurance, and payment of the policy was declined because of breach of warranty. The Court of Appeals held that the agent who canvassed the applicant first was the representative of his company, and as such agent he was authorized to receive application

<sup>1</sup> *Bernard vs. United Life Ins. Assoc.*, 11 Misc. Rpts., N. Y., 441.

<sup>2</sup> *Clemens vs. Supreme Assembly Royal Society Good Fellows*, 131 N. Y., 485; *Kemp vs. Good Templars Mutual Benefit Assoc.*, 19 N. Y. Sup., 435; *United States Life Ins. Co. vs. Smith*, 92 F., 503, U. S. C. C. A., 1899; *March vs. Metropolitan Life Ins. Co.*, 86 Pa. St., 629.

<sup>3</sup> *Wyman vs. Fidelity Mutual Life Assoc.*, 17 Pa. Co., Ct. R., 259.



for insurance. He was furnished with blank forms, which, when filled out and signed by the applicant and delivered to the agent, constituted and completed the application for insurance. Everything that followed the application was an element of its result. Such an application was properly signed and delivered to the agent; when that was done, an application was made to the company for insurance. No other act of the applicant was needed. What the company, through its officers or agents, might do or omit to do with it constituted the result of the application, as to which a truthful answer was required. A false answer was given. The application was made and was not successful. If the truth had been told, the contested policy would never have been issued. The test was not whether the agent or the medical examiner had authority finally to reject the application. If they were utterly without authority to dispose of it and the company never acted upon it, at least there was an application to the company which was not successful and did not end in an accepted insurance. The court affirmed the judgment of the lower court in favor of the defendant.<sup>1</sup> While the decision may savor of severity, yet it must be acknowledged that it is strictly within the terms of the contract, which demanded a true reply to the question in regard to previous efforts to secure insurance.

The courts have gone even farther, and have decided that an informal examination, which many agents solicit an examiner to make, if discontinued as useless because of the applicant's family or personal history or physical condition, is virtually a rejection. The court held that such an informal unwritten examination, even if it was not based on a written application, and was discontinued by the examiner as useless, was within the meaning of the question whether "any proposition or negotiation or examination for life insurance has been made in this or any other company on which a policy has not been issued."<sup>2</sup>

In those applications in which it is the province of the medical examiner to ask the question in reference to previous rejection, and the same thing is to be said in regard to each and every question answered in an application blank, the reply "yes" or "no" must be inserted instead of a check or a ditto mark. A check mark (✓) placed opposite a question as to whether any proposition, negotiation, or examination for insurance on the applicant's life had been made previously, on which no policy was issued, cannot be construed as a negative answer when it appears that like check marks were placed opposite certain other questions which previous answers seemed to render immaterial, apparently meaning that the question was noted, but no answer was deemed necessary, and that, as a matter of fact, although the applicant had made other applications, he could not have known at the time in question whether or not policies had been issued thereon. If the company accepted such an application, it would waive all answers thus (✓) marked as irrelevant.<sup>3</sup>

<sup>1</sup> A. R. Edington, et al. *vs.* The Aetna Life Ins. Co., 100 N. Y., 536.

<sup>2</sup> Mutual Life Ins. Co. of N. Y. *vs.* Nichols, 24 S. W. Rptr., 910.

<sup>3</sup> Manhattan Life Ins. Co. *vs.* P. J. Willis & Bro., 8 C. C. A., 594.

**Suicide** has been defined legally as the act of malicious self-murder.<sup>1</sup> Suicide by any means whatsoever has been held to be synonymous with the phrases "die by his own hands" and "dying by one's own hand."<sup>2</sup>

Vital statistics have shown that in recent years there has been an increase in the number of suicides, especially in the urban populations, and the experience of life insurance companies has proved that there has been a similar increase in suicides among those insured. Dr. Elias J. Marsh, in a monograph on the *Mortality from Suicides*, stated that the experience of the Mutual Life Insurance Company of New York from 1844 to 1873 showed that 1.1 per cent. of the total mortality was due to suicide, while from 1884 to 1893, when there was an enormous increase in the business of that company, the mortality caused by self-destruction was 2.1 per cent. of the total mortality. Dr. Marsh further analyzed the suicide mortality by collating the statistics of deaths that occurred within ten years of the date of insurance; these showed that in the epoch from 1844 to 1873 the deaths due to suicide constituted 1.25 per cent., while from 1884 to 1893 they amounted to 3.18 per cent. of the total decennial mortality; and this increased mortality was greatest during the third, fourth, and fifth years of insurance.

Dr. John Winters Brannan, in a report on the medical statistics of the Washington Life Insurance Company, stated that from 1860 to 1886 the suicide was 2.5 per cent. of the total mortality experienced by that company. From 1860 to 1873 the deaths by suicide constituted 2 per cent.; from 1873 to 1878 they were 2.4 per cent.; from 1882 to 1886 they were 3.4 per cent.; from 1887 to 1891 they were 1.9 per cent., and from 1892 to 1896 they were 3 per cent. of the total mortality for each period.

These last-mentioned facts indicate that there is an increase in the tendency of individuals who have found that life is not worth living, or who have reached the end apparently of their financial or business resources, to turn their deaths to a profitable advantage to their relatives. Within a few years an individual applied to one of the prominent insurance companies of New York City for a policy, and when he found that the contract contained a clause that would avoid the policy if the insured died by suicide within one year, he asked for and was given an extra premium rate to compensate the company for the risk assumed by striking out that clause. Within a very short time after the policy was issued the insured committed suicide, and the company was subjected to the unpleasant criticism of having furthered the act of self-destruction.

<sup>1</sup> *Bank of Oil City vs. Guardian Mutual Life Ins. Co.*; *Bigelow, Life and Association Report*, vol. v, 478.

<sup>2</sup> *Hartman vs. Keystone Ins. Co.*, 21 Penna. State, 446; *Bristed et al. vs. The Farmers' Loan and Trust Co.*, 8 N. Y., 299; *Eastabrook vs. Union Mutual Life Ins. Co.*, 54 Me., 224; *Cooper vs. Life Ins. Co.*, 102 Mass., 227; *Life Ins. Co. vs. Terry*, 15 Wall., 580; *Bigelow vs. Berkshire Life Ins. Co.*, 93 U. S., 284; *Manhattan Ins. Co. vs. Broughton*, 109 U. S., 121; *Conn. Ins. Co. vs. Lathrop*, 111 U. S., 612; *Conn. Mutual Life Ins. Co. vs. Akens*, 150 U. S., 468.

The statutes of a number of the states of the Union make an attempt at suicide a crime or misdemeanor, and the payment of a death claim has been contested because of a provision in the contract that the latter should be void in the event that death was the consequence of a duel, or by the hands of justice, or in violation of or attempt to violate any criminal law of the United States or of any state or county in which the insured was. However, it has been held judicially that while "the attempt to commit suicide is a crime, the accomplishment of the purpose to do so is not; and while the insured had the purpose of taking his own life and fully accomplished such purpose, the result of his act, influenced by such intent, being his death, yet by the accomplishment of suicide he violated no criminal law."<sup>1</sup>

It would be too strong an assertion to say that legislative efforts to legalize suicide had been made, but legislation had been enacted with the intent to enable the suicide to benefit by his act despite the terms of any contract. "In all suits upon policies of insurance on life hereafter issued by any company doing business in this state it shall be no defense that the insured committed suicide, unless it shall be shown to the satisfaction of the court or jury trying the cause that the insured contemplated suicide at the time he made his application for the policy, and any stipulation in the policy to the contrary shall be void."<sup>2</sup> The impracticability of presenting evidence of the character demanded in a small or large number of months after the application for insurance was made is at once apparent.

There is a diversity of opinion among the officials of the various life insurance companies in regard to the value of a proviso that voids the policy in the event of the suicide of the insured. Of the 44 principal companies engaged in business in this country, 8 omit any reference to suicide; 3 provide, in effect, that death by self-destruction, except upon satisfactory proofs that the insured was so far insane as to destroy his responsibility therefor, is a risk that is not assumed, though in some cases the company will return the cash reserve on the policy; 5 companies specify that for one year after the date of issue of the policy self-destruction, sane or insane, is not a risk assumed by the company; 21 companies contract that if within two years from the date of the policy the insured shall, whether sane or insane, die by his own hand, then the policy shall be null and void; and 7 companies provide that if the insured shall commit suicide within three years after the issue of the policy, the latter will become null and void.

If the clause that exempts the insurer from liability in the event of the death of the insured by suicide is contained in the application, it is equally binding. "A warranty in the application that the insured will not die by his own hand has the same effect as a condition in the policy that the same shall be void if the insured shall die by his own hand."<sup>3</sup>

<sup>1</sup> M. J. Darrow *vs.* Family Fund Society, 116 N. Y., 537.

<sup>2</sup> Rev. Stat. Mo., 1879, §5, 982.

<sup>3</sup> Mutual Life Ins. Co. *vs.* Leubree, 71 Fed. Rept., 843, 18 C. C. A., 332.



An insurer declined to pay a policy because the latter contained a proviso that exempted him from liability in the event of death from any immoral practice, and the plea was made that the death of the insured by suicide was the result of an immoral practice. The court held that the act of suicide was not an immoral practice within the meaning of the terms of the policy.<sup>1</sup> This decision shows the necessity of clearness of phraseology in the language of the application and the policy, as the court will be likely to interpret what is said rather than what is meant. It is a general legal principle that in an action on a life policy the burden of proof is on the company to show that the insured came to his death by suicide.<sup>2</sup> And courts have gone to the extent of precluding resort by a company to the verdict of a coroner's inquest, as was decided in an action on a life insurance policy that the burden of proving suicide as a defense remained on the insurer throughout, and was not shifted by the verdict of the coroner's inquest.<sup>3</sup> It is quite evident that to present such proof is often as difficult as to present more than circumstantial evidence to convict a murderer. Circumstantial evidence, however, is not a good ground for defense, as was held in an action on a policy of life insurance where the defense was self-destruction. The court decided that the burden was on the insurer to establish suicide, and when circumstantial evidence only was relied on, the defense failed, unless the circumstances excluded with reasonable certainty any hypothesis of death by accident or by the act of another.<sup>4</sup>

In the celebrated case of Walter Dwight, he, when a bankrupt, applied for insurance in a number of companies, was accepted by 21 of them, and was insured for \$255,000, at an annual cost of over \$8000 in premium. The premiums were payable quarterly, but before the second quarter's premiums were due, he had his hair and beard cut off so as to change his appearance, and made a will leaving money for a Christmas dinner for the poor, for a town library, for an annual dinner to newspaper men, \$5000 for the coroner who was to hold an inquest on his body, and \$10,000 for the surrogate who was to pass upon the will. Within four days of the date when the second quarter's premiums were due Mr. Dwight died under very suspicious circumstances. Dr. Horatio C. Wood and the other physician who made the post-mortem examination testified that death could have been produced only by strangulation by means of a cord. There was virtually no conflict in the expert testimony. One of the companies interested was selected to defend a test-suit, and it won its case on a technicality—breach of warranty. The other companies, *ad interim*, deemed it less expensive to compromise the claims against them than to pay the costs

<sup>1</sup> Mutual Aid Society *vs.* Wanner, 24 Ill. App., 357.

<sup>2</sup> Gooding *vs.* United States Life Ins. Co., 46 Ill. App., 307; Mutual Life Ins. Co. of N. Y. *vs.* Simpson, 28 S. W., 837; Travelers Ins. Co. *vs.* Nitterhouse, 38 New Eng., 110.

<sup>3</sup> Mutual Life Ins. Co. *vs.* Hayward, 27 S. W. Repts., 36; Metzradt *vs.* Modern Brotherhood of America, 84 N. W., 498; Union Mutual Life Ins. Co. of Portland, Me., *vs.* Payne, 105 F., 172; Wasey *vs.* Travelers Ins. Co., 85 N. W., 459.

<sup>4</sup> Laman *vs.* Manhattan Life Ins. Co., 15 So. Rpts., 388.

of litigation, so a compromise was effected. The bequests to a coroner and surrogate were extraordinary, and calculated to excite suspicion even if disassociated from the results of the postmortem examination or from the fact that a bankrupt was carrying insurance that could be maintained only by a man of large financial resources.

The case suggests the question whether an insurance policy should be avoided if it was taken out by the insured with the intent to commit suicide. The Court of Common Pleas of Pennsylvania held that one guilty of suicide, who had his life insured, committed a fraud upon the company, and there could be no recovery on the policy, whether there was such a condition expressed therein or not. Such fraud would defeat recovery by the insured's assignee or by the representative of his estate.<sup>1</sup> This view was probably based on the dictum of the Supreme Court of Pennsylvania, which sustained the charge of a judge of a trial court, that if no condition which voided the policy in the event of suicide of the insured had been inserted in the contract, a man who committed suicide was guilty of such fraud upon the insurers of his life that his representatives could not recover for that reason alone. This dictum has been sustained by decisions in Massachusetts,<sup>2</sup> and conforms with the decisions of the English courts, which have held that if a man commits self-destruction voluntarily, and knows at the time what will be the effect of the act he is about to commit, and does commit it, his policy is forfeited even if he is incapable of judging between right and wrong.<sup>3</sup>

There is, however, conflicting authority in this matter. A more recent Pennsylvania decision held that where a policy of life insurance contains no provision, stipulation, or condition as to suicide, the policy will not, if the insured commits suicide, be avoided as against the wife of the insured who is the nominated beneficiary.<sup>4</sup> And it was held in Illinois: Where a policy of life insurance contains no provision making suicide or self-destruction by the assured a forfeiture of the policy, intentional self-destruction while sane will avoid the policy only where such a policy is by its terms payable to the assured or his personal representative.<sup>5</sup>

In a recent case in which a man insured heavily although in involved circumstances financially, and committed suicide just before the time the second premiums on his policies were due, the court decided that "the policy was clearly a fraud upon the defendant without any clause that suicide avoided the policy. The deceased designed to get a large aggregate of insurance. He was unable, and did not intend, to continue the payment of the premiums until death came naturally, but his purpose was to provide for creditors and family by causing his own death. This was a legal fraud in its inception, and a policy thus obtained never

<sup>1</sup> *Bank of Oil City vs. Guardian Mutual Life*, 5 Bigelow, 478.

<sup>2</sup> *Dean vs. Am. Mutual Union Life Ins. Co.*, 4 Allen, 96.

<sup>3</sup> See also *A. H. Ritter vs. Mutual Life Ins. Co. of N. Y.*, 69 U. S., 139, 1898.

<sup>4</sup> *L. Morris vs. State Mutual Life Assur. Co. of Worcester, Mass.*, 183 Pa., 563, 1898.

<sup>5</sup> *Supreme Lodge Knights of Pythias of the World vs. Kutscher*, 72 Ill. App., 462, 1897; also *Patterson vs. Natural Premium Mutual Life Ins. Co.*, 75 N. W., 980, 1898.

had any binding force in his hands."<sup>1</sup> The jury was instructed that if the deceased took out the policy with the intent to commit suicide, and did, in fact, commit suicide in pursuance of that intent, the action failed if the deceased was sane when he took his own life. The case was appealed and the higher court affirmed the judgment, and said: "Some of the evidence was resisted on the ground that death by suicide was no defense under the terms of the policy. That is true; but the defense was fraud, and suicide the ultimate agency by which the fraud was accomplished. It was necessary, therefore, to prove it, and in such a manner as to indicate that it was not an insane or sudden impulse, but the culmination and effective working out of a deliberately conceived purpose of fraud."<sup>2</sup>

Though the contract of insurance should contain a clause that exempts the insurer from liability in the event of the death of the insured by suicide, the policy would not necessarily be void, for the reason heretofore mentioned that the onus of proving that the insured committed suicide rests upon the insurer. If, however, there was a clause in the policy excluding liability in the event of suicide, and the latter was proved to have caused death, there can be no recovery by the beneficiary.<sup>3</sup> It has been decided that where there is no express provision in the policy that in the event of the insured dying by his own hand the policy shall become void, such a policy is not vacated by the circumstance of the deceased dying by his own hand while in a state of temporary insanity.<sup>4</sup> Where it is shown that an insured person committed suicide, in the absence of evidence that he was insane at the time his sanity will be presumed.<sup>5</sup>

When the evidence in regard to the death being accidental or suicidal is so nearly balanced as to leave the question in doubt, the presumption has been held to be in favor of the theory of accidental death.<sup>6</sup>

Inferential or circumstantial evidence has occasionally been given due weight, and a precedent for such a course by the court was established in an action on a policy of life insurance in which the plaintiff's right of recovery was dependent on proof that the insured did not die by suicide. In the case at issue it was conceded that the insured was not killed by another person, and the evidence excluded an inference of accident, so a verdict for the plaintiff was set aside as contrary to evidence.<sup>7</sup>

In another case it was decided that a verdict that the insured's

<sup>1</sup> *Smith vs. Mutual Benefit Society*, 51 Hun, 575.

<sup>2</sup> *Ibid.*, 123 N. Y., 85.

<sup>3</sup> *Weld vs. Metropolitan Life Ins. Co.*, 61 Ill. App., 187; also *Grand Lodge of Illinois, Independent Order of Mutual Aid vs. Wieting*, 168 Ill., 408 (1898); *Sargeant vs. National Life Ins. Co.*, 41 A., 351 (Pa., 1898); *Parish vs. Mutual Benefit Life Ins. Co.*, 49 S. W., 153 (Texas, 1898); *Hopkins vs. Northwestern Life Assur. Co.*, 94 F., 729, 1899.

<sup>4</sup> *Horn vs. The Anglo-Austrian and Univ. Family Life Ins. Co.*, 2 Bigelow, 602; *Mills vs. Rebstock*, 29 Minn., 381; *Tritschler vs. Keystone Mutual Benefit Assoc.*, 180 Pa. St., 205.

<sup>5</sup> *Hopkins vs. Northwestern Life Assur. Co.*, 94 F., 729, 1899.

<sup>6</sup> *Mutual Life Ins. Co. vs. Wiswell*, 56 Kans., 765.

<sup>7</sup> *Swezey vs. Prudential Life Ins. Co. of America*, 22 N. Y., Sup., 1024; also *Germania Life Ins. Co. vs. Ross-Lewin*, 51 P., 488; *Sackberger vs. National Grand Lodge I. O. T. L.*, 73 Mo. App., 38.



death was not by suicide was against the evidence, he having been found beside a highway, near a house, hanging from a tree, with a halter round his neck, with fresh blood on the ground under him coming from cuts in his right arm, he being left-handed, there being no evidence of a struggle or anything else indicating murder, and there being proof of despondency, want of employment, debt, family troubles, and declarations indicating a suicidal intent.<sup>1</sup>

The Supreme Court of the United States, however, is authority for the opinion that there is "a presumption that a sane man would not commit suicide."<sup>2</sup> An analogous opinion was expressed by a trial judge in New York, who held that "the law does not and cannot presume that a man in the full possession of his mental faculties, in that normal condition of mind which we call sanity, will deliberately take his own life, and therefore, so far as there is any presumption, it favors insanity at the time of committing an act of self-destruction." But the Superior Court reversed this judgment on the ground that "the rule that insanity is to be presumed until the contrary is proven is a general one, applicable to all cases. . . . Aside from extrinsic facts and circumstances, therefore, the law presumes that every person who destroys his own life is sane up to the very moment when he does the act which causes his death. Can it properly be said, then, that the commission of that act not only removes the presumption of sanity, but establishes a legal presumption that he was insane?"<sup>3</sup>

In a more recent case the court decided: "It has been uniformly held in other cases, that as sanity is the normal condition of man, it is presumed as to each individual, and that it was incumbent upon the plaintiff to overcome this presumption by proof that the self-destruction was not the conscious voluntary act of one responsible for his actions; that the insured was, in fact, insane. Insanity cannot be presumed from the mere fact of suicide."<sup>4</sup>

On the other hand, it has been decided that where the clause in the policy exempts the insurer from liability in the event of death by suicide, such liability is not excluded where there was an intentional suicide when the reasoning faculties were so far impaired by insanity as to be incapable of understanding the moral character of the act, even though appreciating its physical nature and consequences. The courts have held that in the phrase "self-destruction of the assured, in any form, except upon proof that the same is the direct result of disease," the word "disease" being unrestricted by anything in the context, included disease of mind as well as of body.<sup>5</sup>

It has been held that a warranty that the insured will not die by his own act, whether sane or insane, is valid.<sup>6</sup> This opinion was elaborated

<sup>1</sup> *Pagett vs. Connecticut Mutual Life Ins. Co.*, 66 N. Y. S., 804 (New York, 1900).

<sup>2</sup> *Connecticut Mutual Life Ins. Co. vs. Akens*, U. S. 150, 468.

<sup>3</sup> *Caffey vs. Home Life Ins. Co.*, 4 Bigelow, 224.

<sup>4</sup> *Weed vs. Life Ins. Co.*, 70 N. Y., 561.

<sup>5</sup> *Connecticut Mutual Life Co. vs. Akens*, 150 U. S., 468; *Bigelow vs. Berkshire Ins. Co.*, 93 U. S., 284; *Manhattan Ins. Co. vs. Broughton*, 109 U. S., 121; *Connecticut Ins. Co. vs. Lathrop*, 111 U. S., 612.

<sup>6</sup> *Kelly vs. Mutual Life Ins. Co.*, 75 Fed. Rep., 637.

in a decision by the Supreme Court of the United States in which it was held that "if the insured, being in the possession of his ordinary reasoning faculties, from anger, pride, jealousy, or a desire to escape from the ills of life, intentionally takes his own life, the proviso attaches and there can be no recovery. If the death is caused by the voluntary act of the assured, he knowing and intending that his death shall be the result of his act, but when his reasoning faculties are so far impaired that he is not able to understand the moral character, the general nature, consequences, and effect of the act he is about to commit, or when he is impelled thereto by an insane impulse, which he has not the power to resist, such death is not within the contemplation of the parties to the contract, and the insurer is liable."<sup>1</sup>

In an action on a life policy that had a condition which rendered it void if the insured should die by his own hand, it was held that the company was liable if the suicide was committed at a time when the insured's faculties were so impaired that he was unable to comprehend the general nature, consequences, and effect of the act, or if he was impelled thereto by an insane impulse which he had not the power to resist. The court held that the opinion had been expressed<sup>2</sup> "that a man so insane as to be incapable of discerning between right and wrong can form no intention. This, it must be observed in passing, is a much broader proposition than that the failure to appreciate the wrong of a particular act evinces a total deprivation of reason. The loss of moral sense, even to that extent, in one who had previously possessed it, would undoubtedly be a fact bearing strongly upon the question whether he retained his other faculties. But in the practical administration of justice in cases of this description, it seems to us a dangerous doctrine to hold that the attention of the jury should be directed principally to the degree of appreciation which the deceased had of the moral nature of his act, and that this question, most speculative and difficult of solution, should be made the test by which it should be determined whether he had knowingly and voluntarily violated the condition of his insurance. The real question is, whether he did the act consciously and voluntarily, or whether from disease his mind had ceased to control his actions. Supposing a man to be in possession of his will and of the ordinary mental faculties necessary for self-preservation, but that his mind has become so morbidly diseased on the subject of suicide that he cannot appreciate its moral wrong, and in this condition of mind he takes his own life voluntarily and intentionally, perhaps with the very object of securing to his family the benefits of an insurance upon his life, it is difficult to say that this is not a death by his own hand, within the meaning of the policy. It has been doubted whether public policy would permit an insurance covering the case of intentional suicide by the assured while sane. But, however this may be, no rational doubt can be entertained that a condition exempting the insurers from liability in case of the death of the insured by his own hand, whether sane or

<sup>1</sup> Mutual Life Ins. Co. *vs.* Terry, 15 Wallace, 580.

<sup>2</sup> Breasted *vs.* The Farmers' Loan and Trust Co., 8 N. Y., 305.

insane, would be valid if mutually agreed upon between the insurer and the insured. When nothing is said in the policy with respect to insanity, the words 'die by his own hand' in their literal sense comprehend all cases of self-destruction. The exceptions which have been ingrafted upon these words by judicial decisions must rest upon the ground that the excepted cases would not have been within the meaning of the parties to the policy. The intent on the part of the insurer in inserting the condition is evident. The policy creates in the assured a pecuniary interest in his own death. To a man laboring under the pressure of poverty and the urgent wants of a dependent family, or of inability to discharge sacred pecuniary obligations or other similar causes, the policy offers a temptation to self-destruction. To protect the insurers against the increase of risk arising out of this temptation is the object for which the condition in question is inserted. The condition ought, therefore, to be so construed as to exclude only those cases in which these motives could not have operated, such as accident or delirium. So far as considerations of public policy have any place in determining such a question, they are undoubtedly in favor of confining the exceptions to the condition to cases in which self-destruction is clearly shown to have been accidental or involuntary."<sup>1</sup>

In consequence of such interpretations of the language of the contract a large number of the more important companies phrase the suicide clause so that it reads, "'self-destruction, sane or insane,' 'suicide while sane or insane,' or 'if the insured shall die by his own hand or act, whether sane or insane'—shall void the policy." Notwithstanding such specificity, the words seem to be susceptible of other construction. In an instance where such a clause existed the trial court held that it was for the jury to inquire whether it was reasonably satisfied "on the evidence presented that the mental condition of the assured at the time the pistol exploded was such that the act on his part was not a voluntary act, because if the act was not an act of his own will, the exception in the policy did not apply to the case and the company would be liable. If, on the other hand, whether the jury believed that he was sane or insane at the time, it saw any evidence in the case that warranted the conclusion that the insured intended self-destruction, either for the purpose of relieving himself from the condition he was in, or any other purpose, then the plaintiff would not be entitled to recover. The primary and important question to determine was, whether he was actuated by a will—whether it was a voluntary act, or whether it was an impulse over which he had no control. If it was the latter, then he was not a responsible agent, and it was not a case that exempted the company from liability." On appeal the court held that the introduction of the words "sane or insane" could have no further effect than to hold the policy void if the insured intended self-destruction while in a state of insanity."<sup>2</sup>

<sup>1</sup> Van Zandt *vs.* The Mutual Benefit Life Ins. Co., 55 N. Y., 169.

<sup>2</sup> De Gorgoza *vs.* Knickerbocker Life Ins. Co., 65 N. Y., 232; Northwestern Mutual Life Ins. Co. *vs.* Maguire, 19 Ohio Cir. Ct. R., 502.



In a suit on an insurance policy containing "the sane or insane" clause in reference to death by suicide, it is not necessary to relieve the insurer from liability that a person taking his own life was conscious of the moral quality or consequences of the act, but only that he knew that the means employed would cause death or endanger his life.<sup>1</sup>

The question has arisen in regard to the liability of the company in the event that the policy provided that the insurer should not be liable if the insured should die by his own hand, and death so occurred in consequence of accident or mistake. In one case a State Supreme Court held that if the insured drank to intoxication, and while in that condition, by accident or mistake, took an overdose of laudanum and died therefrom, it was not dying by his own hand as intended by the terms of the policy, even though the mistake or accident was, to an extent, occasioned by the drunkenness. But if the deceased took the laudanum with intent to destroy his life, it was immaterial that he was drunk at the time and the policy was avoided.<sup>2</sup>

Another court held that "it would not be a fair interpretation of this clause . . . to hold it to cover the case of a purely accidental death from poisoning occurring to a sane person, through mistake or ignorance, though his own hand might have been the innocent instrument by which the deadly potion was conveyed to his lips. Such an accident cannot be presumed to have entered into the minds of the contracting parties or to have been intended to be stipulated against. The insurance was intended to cover the risk of premature death, which might result from any of the casualties to which human life is subject, self-destruction being excepted. A purely accidental act, committed by a sane person with no idea of injuring himself, cannot be regarded as an act of self-destruction within the meaning of such a contract. Suicide is the act stipulated against. The words voluntary or otherwise preclude the parties claiming under the policy, if the act was one of suicide, from setting up the condition of mind of the party committing it, and contending that it was an involuntary act of suicide. But still it must be a suicide, and who would contend that the taking of poison by mistake, or any other act which a sane person might innocently commit, although it should result in death, was what is ordinarily understood as self-destruction or suicide? It is unreasonable to suppose that one effecting insurance upon his life, in stipulating against death by his own hand or act, could intend to embrace such a casualty, or that the insurance company could fairly expect him so to understand."<sup>3</sup>

The medical examiner should inform the home office of a company if he is cognizant that an applicant he examines is in involved financial circumstances, or is assuming a liability for premium payments that is unwarranted by his income. So, too, in the event of the death of

<sup>1</sup> *Nelson vs. Equitable Life Assur. Soc.*, 73 Ill. App., 133, 1898.

<sup>2</sup> *The Equitable Life Assur. Soc. vs. C. A. Patterson*, 41 Ga., 338.

<sup>3</sup> *Penfold vs. Universla Life Ins. Co.*, 85 N. Y., 320, vide *Life Ins. Co. vs. Hazlett*, 105 Ind., 212; *Union Mutual Life Ins. Co. of Portland, Me., vs. Payne*, 105 F., 172 (U. S. C. C. A., Texas, 1900).

the insured under suspicious circumstances, a coroner may further the interests of all parties concerned by a thorough inquest, any connivance at concealment of facts being as prejudicial to the interests of the insured as to those of the insurer. No life insurance company desires to engage in litigation, and when it does so, it is because the officials thereof believe that they would be properly criticized and condemned by State Commissioners for the payment of improper or fraudulent death claims, and, further, that the payment of such claims would be detrimental to the financial interests of the policy holders. These are the reasons that impel the insurer to contest a claim, rather than any desire to deprive a beneficiary of what may appear to be a just obligation. Each of such claims as is paid increases the weight of precedent for subsequent suicide death claims.

**Health When Policy is Delivered.**—Most applications provide that there is no insurance until they have been received, approved, the policy issued, and in some instances delivered, and the premium paid during the applicant's lifetime and good health. Every physician can appreciate that it is possible for him to examine and recommend an applicant who may be affected with some acute or even chronic disease that has given no indication of its existence, and that may develop its symptoms shortly after the examination. Good health or sound health means that state of health which is free from disease or ailment that seriously affects the general healthfulness of the system, but not a mere indisposition.<sup>1</sup>

Where it is stipulated that no obligation is assumed by the insurer, unless, at the date of the policy, the insured is in sound health, there can be no recovery on such a policy if it is proved on the trial that the insured was not in sound health at the date of the policy.<sup>2</sup> An applicant warranted that he never had pneumonia; when the policy was received by the agent and tendered to him he postponed taking it, and subsequently it was paid for by a business associate. It was proved that at the latter time the insured had pneumonia, from which he died. The court held that a statement made in an application, whether a warranty or only a representation, "speaks from the time of the delivery of the policy, and if, after the statement is made, a material change occurs in the condition of the applicant, covered by such statement, before the contract is consummated, an absolute duty rests upon the applicant to make disclosure of the fact. Courts of equity cannot sustain an insurance upon the life of a dying man when the nature of his malady and the seriousness of his illness are concealed from the insurer."<sup>3</sup> In a case somewhat similar to the foregoing, in which, at the time of the delivery of the policy and payment of the premium, the insured was in bed with a cold which developed into pneumonia, causing his death two days later, the court held that it was for the jury to decide whether

<sup>1</sup> Ohio Mutual Life Assoc. *vs.* Drady, 8 Ohio N. P., 140, 1900.

<sup>2</sup> Metropolitan Life Ins. Co. *vs.* Howle, 56 N. E., 908 (Ohio, 1900).

<sup>3</sup> Cable *vs.* United States Life Ins. Co., 111 Fed. Rptr., 19, U. S. C. C. A., Illinois, 1901.

he was in "good health" within the meaning of the policy when the latter was delivered.<sup>1</sup>

It has been held also that where such provisions existed in an application, and when the policy was delivered by the general agent of the insurer, the insured was at home, sick, and such facts were known to the agent, his act of delivery of the policy was a waiver of the condition.<sup>2</sup>

**Previous Health.**—In an action on a life insurance policy, where the defense is fraudulent representations as to health, the insurer may prove statements made by insured touching his health at about the time of, before, and after the issuance of the policy.<sup>3</sup> In general, it is understood that in construing an application for life insurance, and the answers to questions therein which call for a statement by the applicant as to whether or not he has ever had any disease of certain organs, a mere temporary ailment, not indicating any vice in the constitution, nor such as to affect the general health or continuance of life, is not to be considered a disease, a failure to mention which constitutes a misrepresentation.<sup>4</sup> And this fact is true even if the insured failed to mention one or two temporary attacks of some disease of the organs specified.<sup>5</sup>

Even more liberal construction has been placed on the omission of the insured to specify the existence of some former illness. A court has held that the fact that the insured, in answering questions in his application for life insurance as to his previous health, concealed a previous ailment, does not avoid the policy under the provision that the statements in the application were warranties, where it appeared that he had fully recovered from such ailment.<sup>6</sup>

In another instance it was held that a negative answer by an applicant for life insurance to the question in the application whether he ever had "any serious illness, constitutional disease, or surgical operation" is not a false representation which will avoid the policy as a breach of warranty because he has had a slight illness, or because he once broke his leg, which was set and attended to by a physician.<sup>7</sup>

A similar decision ruled that "the applicant was required to answer 'yes' or 'no' as to whether he had been afflicted with certain diseases. In respect of some of those diseases, particularly consumption and diseases of the lungs, heart, and other internal organs, common experience

<sup>1</sup> *Barnes vs. Fidelity Mutual Life Assoc.*, 43 A., 341.

<sup>2</sup> *Ames vs. Manhattan Life Ins. Co. of N. Y.*, 58 N. Y. S., 244, 1899; also *Ames vs. Metropolitan Life Ins. Co.*, 60 N. E., 1106 (New York, 1901).

<sup>3</sup> *Welch vs. Union Cent. Life Ins. Co.*, 78 N. W., 853 (Iowa, 1899).

<sup>4</sup> *Rand vs. Provident Savings Life Assoc.*, 37 S. W. Rptr., 7; *Manhattan Life Ins. Co. vs. Francisco*, 17 Wall., 672; *Tooker vs. Security Trust Co.*, 58 N. E., 1093 (New York, 1900); *Fidelity Mutual Life Assoc. of Philadelphia vs. Miller*, 92 F., 63, Metropolitan.

<sup>5</sup> *Northwestern Mutual Life Ins. Co. vs. Heimann*, 93 Ind., 24; *Connecticut Mutual Life Ins. Co. vs. Union Trust Co.*, 112 U. S., 250; *Dreier vs. Continental Life Ins. Co.*, 24 Fed. Rep., 670; *Rand vs. Provident Savings Life Assoc.*, 97 Tenn., 291.

<sup>6</sup> *Northwestern Mutual Life Ins. Co. vs. Wood*, 54 Kan., 663.

<sup>7</sup> *Caruthers vs. Kansas Mutual Life Ins. Co.*, 108 F. 487 (U. S. C. C. Arkansas, 1901).



informs us that an individual may have them, in active form, without at the time being conscious of the fact, and beyond the power of any one, however learned or skilful, to discover."<sup>1</sup>

The Massachusetts law provides<sup>2</sup> that no misrepresentation made in the negotiation of insurance shall avoid the policy unless such misrepresentation was made with intent to deceive or the matter misrepresented increased the risk of loss. In a suit brought under the foregoing statute the court decided that a misrepresentation in an application for insurance that the applicant did not have a certain disease will not avoid the policy if the jury finds that such misrepresentation did not increase the risk and was not made with intent to deceive.<sup>3</sup> It would seem that the insured failed to give the insurer certain information that it desired, that it assumed was given truthfully, and that formed part of the reason for making the contract. So it is not clear why the jury should decide whether the misrepresentation increased the risk.

In another instance the judge said: "The applicant may not know enough of the human system to be aware of some affection of the vital organs. The victim of Bright's disease, or of an affection of the heart, liver, or lungs may be, and often is, in the enjoyment of such a condition of health and strength as to lead him to the belief that his vital organs are all sound. It would be monstrous to hold, in such a case, that the applicant warranted himself to be sound as to those organs by an answer to the effect that he was never sick or had no disease of those organs. The company retain their own medical advisers for the purpose of making a careful and scientific examination of all applicants for life insurance; and they are far better able to detect incipient disease than the subject, in most cases. . . . The assured must state all that he knows bearing upon the condition of his health; and any untrue statement or concealment in this respect ought, justly, to render the policy void. In all respects where it appears, or can be proved, that the applicant had any knowledge of the facts called for by the interrogatories, it matters very little whether the answer be held a warranty or not, inasmuch as an untrue statement will be a misrepresentation or fraud which will equally render the policy void."<sup>4</sup>

In a case in which the insured died of consumption a year and a half after the policy was issued, it was proved that the insured had pneumonia, chronic bronchitis, and habitual hoarseness previous to the time he effected the insurance. The court held that if the statements made by the insured were untrue, the contract became null and void.<sup>5</sup> Another decision held that if the insured "had any affection amounting to a *disease* of the kind mentioned, his negative answer would be a material misrepresentation, no matter how 'trifling' the character of the

<sup>1</sup> *Moulor vs. Life Ins. Co.*, 111 U. S., 335; also *March vs. Metropolitan Life Ins. Co.*, 186 Pa. St., 629; *Ames vs. Manhattan Life Ins. Co. of New York*, 58 N. Y. S., 244 (New York, 1899).

<sup>2</sup> Statutes, 1887, c. 214, § 21.

<sup>3</sup> *Hogan vs. Metropolitan Ins. Co.*, 164 Mass., 448.

<sup>4</sup> *Horn vs. The Amicable Mutual Life Ins. Co.*, 64 Barb., 81.

<sup>5</sup> *M. J. Day vs. Mutual Benefit Life Ins. Co.*, 1 Washington Law Rep., 22.

affection, nor whether it would have any influence on the length of his life, nor whether it would be noticed by the medical examiner; and if there was an affection amounting to such disease, the question of the materiality of the negative representation would not be open to the jury."<sup>1</sup>

While the examination blanks of virtually all life insurance companies ask the question whether the applicant ever had any illness and require full particulars, it is a matter of daily experience that examiners fail to appreciate the import of the question and are content to record the condition that the applicant suffered from, and omit to mention when he had it, how long he had it, its severity, and whether there were sequelæ. If a medical director inadvertently passes such an examination, the company has no recourse. This was instanced in a case in which an applicant for life insurance, in answer to the question whether he had ever had any illness, stated that he had throat trouble, and the court held that he was not bound to state more particularly the nature of the trouble, no further question being asked.<sup>2</sup>

Failure of an examiner carefully to investigate an applicant's statement may result in erroneous reports that will mislead the insurer. An experienced examiner asked an applicant in regard to the last illness for which he consulted a physician; the applicant replied "canker-sore of tongue," and the examiner recorded the date thereof as one month preceding the examination, and added the word "recovery." The medical director assumed the condition was a small aphthous ulcer, and accepted the risk. It appeared subsequently that four weeks after the examination the insured consulted a prominent surgeon, who found an epithelioma of the base of the tongue, nearly an inch in diameter, with infiltration and induration of the entire base of the tongue and the anterior pillar of the fauces. Two months after the insurance examination the insured had an operation on the tongue, with a second operation two months later, and five months after the examination he died of the disease. The size of the cancer precluded the likelihood that it had developed within four weeks after the examination, and it was likely that the examiner told the applicant to show his tongue, and that organ was protruded between the lips and only the unaffected anterior part was seen. There were other factors in the case that indicated that the insured apprehended the seriousness of his condition when he applied for the insurance, but the company could take no other action than to pay the claim in view of the recorded report of their medical examiner.

**Certificate of Death.**—Most municipalities in this country require, at the present time, a certificate of death from a legally registered physician before a corpse can be interred. Such death certificates contain a variety of information, including very often the duration of the last illness.

<sup>1</sup> *Price vs. The Phoenix Mutual Life Ins. Co.*, 17 Minn., 497; see also *Miles vs. Connecticut Mutual Life Ins. Co.*, 3 Gray, 580; *Vose vs. Eagle Life and Health Ins. Co.*, 6 Cush., 42; *Weil vs. New York Life Ins. Co.*, 17 South., 853; *Rhode vs. Metropolitan Life Ins. Co.*, 88 N. W., 400, 1901.

<sup>2</sup> *Mutual Reserve Fund Life Assoc. vs. Sullivan*, 29 S. W., 190.

It has been decided that the certificate of the attending physician as to the cause of the death of a patient, filed with the board of health in compliance with the state laws, is not admissible in an action on a policy of insurance on the life of such patient, to show that he had a certain disease at the time that he applied for the policy, four years before his death.<sup>1</sup> But it would appear that such a certificate would be accepted in evidence if the information it contained was corroborated by evidence that the insured had been treated by a physician for the same disease and was generally known to have been affected by it.

The reluctance of a court to accept a death certificate as evidence of breach of warranty was shown in an action the issue of which was to prove whether or not the insured had made a true answer in his application as to the cause of his sister's death. The New York Supreme Court held that it was an error to permit the clerk of the town where she died to read the cause of death from a certificate filed in his office by her physician.<sup>2</sup>

**Personal Injury.**—An insured died three years after the policy was issued, and the insurer pleaded the falsity of answers to certain questions in the application, as the insured denied having any personal injury, while there was evidence of a fall from a tree four years before the application was made. The Supreme Court of the United States sustained the charge of the trial court to the jury that "if the effects of the fall were temporary and had entirely passed away before the application was taken, and if it did not affect (the insured's) health or shorten her life, then the non-disclosure of the fall was no defense to the action. On the other hand, if the effects of the fall were not temporary, and remained when the application was taken, or if the fall affected the general health, or was so serious that it might affect the health or shorten life, then the non-disclosure would defeat recovery, although the failure to mention the fall was not intentional or fraudulent."<sup>3</sup>

The serious influence that may be exercised on the expectation of life of an individual by an injury, especially a cerebral, thoracic, peritoneal, or vascular traumatism, is easily appreciated, and concealment of so material a fact would appear to be a fatal breach of warranty. Furthermore, the majority of injuries leave evidence in the form of scars, calluses, etc., which may be useful in the matter of identification. The decisions quoted above are not altogether in accord with the weight of opinion in regard to what constitutes a breach of warranty, although it is evidently the intent of the court to waive as informal only slight or trivial injuries that are so temporary in character that they may be forgotten easily. More recently it has been held that a policy was void because the insured warranted that he had never had any local injury or infirmity, and it was proved that several years previous to such

<sup>1</sup> *McKinley vs. Metropolitan Life Ins. Co.*, 6 Misc. Rep., N. Y., 9.

<sup>2</sup> *Keefe vs. Supreme Council of Catholic Mutual Beneficial Assoc.*, 64 N. Y. S., 1012, 1900.

<sup>3</sup> *Union Mutual Ins. Co. vs. Wilkinson*, 13 Wall., 222; also *Synder vs. Mutual Life Ins. Co.*, 4 Bigelow, Life and Accident, 424.



warranty he had suffered an injury that eventually caused the condition that ended fatally.<sup>1</sup>

**Asthma.**—The applicant is asked whether he has had asthma because that term is used comprehensively to designate a variety of pneumonopathies, and if the disorder is associated with other physical defects the application is generally declined. Dr. E. J. Marsh<sup>2</sup> considered that the rule of the exclusion of all asthmatics had been too rigidly enforced, because many of these persons would be insurable, notwithstanding the blemish of their past physical history, provided that the organs had remained sound and normal.

However, a knowledge of the past existence of the disease is essential to the contract. It was decided that there could be no recovery in an action on a life insurance policy conditioned that no obligation was assumed by the company unless at the date of its insurance the insured was "in sound health," when the evidence showed that for three years before such date the insured was afflicted with chronic asthma to such an extent that he was unable to pursue his usual calling, and that this ailment, accompanied by subsequent and resultant complications, led to his death.<sup>3</sup> This decision was based on an obvious breach of warranty, and the fraud was of no advantage to attain the wish of its perpetrator.

If the fact of the former existence of asthma or the likelihood of its recurrence is mentioned in the application, the insurer will be placed in full possession of the facts and may issue a policy which will not subject the beneficiary to a legal contest.

**Bronchitis.**—Most physicians know that it is the custom of many consumptives to refer to their early symptoms as bronchitis, or because of the prominence of the bronchial symptoms, they believe that their malady is but a bronchitis.

In an application for a policy the proponent represented herself in her usual state of health, as having never had any disease except a slight bronchial difficulty in the winter, nor any serious illness or local disease, nor any disease tending to impair her constitution. The policy was issued, and the insured died of consumption in a few months. After death evidence was presented that three days before the application the insured had written a letter to her mother in which she said that her lungs were healing, and that her physician thought that if she lived until spring she would get well. The physician she named in her letter was not the one she mentioned in her application as her regular medical attendant. The State Supreme Court denied a motion for a new trial, the lower court having decided against the beneficiary because of breach of warranty.<sup>4</sup> So apparent is the fraudulent intent in this case that no other decision could be expected.

An applicant stated in his application, which warranted the truth of his answers, that he had last consulted or had been prescribed for by

<sup>1</sup> *Hanna vs. Mutual Life Assur. of City of Brooklyn*, 42 N. Y. Sup., 228.

<sup>2</sup> Reports on Asthma, etc., published by The Mutual Life Ins. Co., 1895.

<sup>3</sup> *Volker vs. Metropolitan Life Ins. Co.*, 21 N. Y. Sup., 456.

<sup>4</sup> *O. S. King vs. The Universal Life Ins. Co.*, 35 Conn., 225.

a physician about three years before, and that he had not consulted or been prescribed for by any other physician for ten years. Undisputed evidence showed that he had been treated two years before by another physician for catarrhal bronchitis, and a third physician, who treated him for a month, found him emaciated, coughing freely, and confined to his bed, and he considered him physically unsound. The court held that there could be no recovery because of false answers that were breaches of warranty.<sup>1</sup> This, like the preceding cause, was undoubtedly a case of tuberculosis.

**Cancer.**—The term cancer is used in a life insurance application in its colloquial sense, comprehending the various forms of neoplasms.

A case arose in which the insured stated in his application that he never had cancer, though in fact prior to the application he had a malignant tumor on his neck, and his regular physician, in consultation with other physicians, pronounced the growth a cancer, and a surgical operation was advised. The insured did not have the operation performed, but went to a "cancer doctor," who used various remedies and healed up the sore, leaving a scar. Between one and two years after the sore was healed, and while there was no evidence of recurrence of the growth, the insured made the application and gave the false answer. After he had effected the insurance the malignant tumor reappeared, and after it had been treated for some months an operation was agreed to, but the insured died. The first suit was decided against the insurance company, but the Superior Court granted a new trial because the matter for the determination of the jury was whether or not the recurrence of the tumor was the reappearance of the old trouble, or whether it was a new and distinct ailment occurring after the insurance was effected. The court held that the evidence "established clearly that the insured had been, prior to his application, afflicted with a malignant fibroid tumor; that treatment had simply arrested it for a time without removing it from his system; and that it reappeared and caused his death. If we are right, he misrepresented the fact, though, as we think, innocently, under the belief that his ailment had been trivial, producing more of fright than danger. But the effect of a misrepresentation of a material and positive fact, upon which an insurer relies, does not depend upon the good faith or honest belief of the applicant making the representation. Such representation must be true, and if not so, substantially, the liability of the insurer will be avoided where the truth of such representation is made the basis of the contract of insurance."<sup>2</sup>

An insured stated in his application for membership in an order that he was free from disease or injury, had never had a serious illness, and had not consulted a physician in regard to personal ailments for seven years preceding the application. The application was part of the certificate, and the statements were warranties. It was proved that on the night of his initiation he said he felt sick, and had to be helped up the stairs to the lodge room, and he left immediately after being initiated.

<sup>1</sup> Fidelity Mutual Life Assoc. *vs.* Harris, 57 S. W., 635 (Texas, 1900).

<sup>2</sup> E. A. Cheever *vs.* The Union Central Life Ins. Co., 5 Bigelow, 458.

Ten days later he died from cancer. Two physicians testified that the cancer might have developed between the date of the initiation and the date of death. The Michigan Supreme Court held that the jury should decide the question whether the deceased had cancer at the time of his initiation.<sup>1</sup>

An applicant showed a medical examiner a pimple on his tongue, and stated that it was not serious, that his health was then and usually good, and warranted his answers. The examiner made only a cursory examination, and discovered no indications of serious disease of the tongue. It was proved that the insured had had symptoms of cancer for two or three years, and that he had consulted two physicians in regard to his health before he applied for the policy. Shortly after the policy was issued he procured medical treatment, was operated on for the cancer, and died. The court held that in an action on the policy a non-suit should be directed.<sup>2</sup>

**Consumption.**—This term is used to designate tuberculosis of the respiratory tract, and just as the disease is the scourge of the general population of all civilized countries, so it is the principal cause of mortality in the experience of life insurance companies. The Mutual Life Insurance Company<sup>3</sup> found that consumption caused 17.61 per cent. of the total mortality; the Washington Life Insurance Company<sup>4</sup> reported that it caused 17.65 per cent. of the total mortality; and the Australian Mutual Providence Society<sup>5</sup> stated that the deaths from phthisis were 12.73 per cent. of the total mortality. Dr. G. S. W. Winston and Dr. E. J. Marsh in their able report stated that while the mortality from consumption was comparatively small during the first year of insurance, it was doubled in the second year, and continued to increase still further; 55 per cent. of the total deaths from consumption occurred within the first five years of insurance. Dr. J. W. Brannan found that the consumption mortality in the second year of insurance was double what it was in the first year, and reached its highest figures between the third and the fifth years, the influence of medical selection being exhausted after two or three years.

In a useful and important study on the *Value of Family History and Personal Condition in Estimating a Liability to Consumption*, Dr. E. J. Marsh presents facts that show that "the importance which has been attached to a family record of consumption is not modified by the age of the applicant; for the influence of this taint is shown as clearly in persons between forty and fifty years as in those between twenty and thirty years of age. . . . The percentage of consumption for persons insured at the ages of twenty to thirty years was 28.5 per cent. among those with untainted record, and about one-third greater, or 37.6 per

<sup>1</sup> *Tobin vs. Modern Woodmen of America*, 126 Mich., 161 (Michigan, 1901).

<sup>2</sup> *Story vs. United Life and Accident Ins. Assoc.*, 125 N. Y., 761.

<sup>3</sup> Preliminary Report of the Mortality Experience of the Mutual Life Ins. Co. of New York from 1843 to 1874, N. Y., 1875.

<sup>4</sup> Historical, Actuarial, and Medical Statistics, N. Y., 1889.

<sup>5</sup> Report on the Mortality Experience of the Australian Mutual Provident Society from 1849 to 1888, Sydney, 1891.



cent., among those with tainted record; at ages from forty to fifty years it was 6.8 per cent. for the untainted and one-third greater, or 9.2 per cent., for the tainted, the proportion of increase being the same in both cases. From these figures it is evident that a consumptive family record is of considerable value as indicating an increased liability to consumption in an applicant, and that the amount of this increased liability may be estimated at 30 per cent."

Dr. Marsh formulates his conclusions in the following rules:

"First, that the history of consumption in any member of the immediate family increases the probability of its appearance in an applicant.

"Second, that consumption in a brother or sister is at least of equal importance as when it has occurred in a parent.

"Third, that persons who are under the standard or average of weight are much more liable to consumption than those above the standard. That the peculiarity of constitution which is indicated by the inability to take and assimilate a proper amount of nutriment indicates a susceptibility to phthisis, or at least is a reasonable suspicion of such predisposition.

"Fourth, that persons who exhibit a robust and well-developed body have little susceptibility to consumption.

"Fifth, that the personal condition of weight and robustness has far more value than the family history in diminishing the liability to consumption; therefore—

"Sixth, the evidence presented by a well-developed body may outweigh the suspicion attached to unfavorable family record.

"Seventh, that these influences of family history and personal weight are of the same grade for every age, and their importance is not lessened by the fact that the individual has reached middle life."

Dr. Marsh's conclusions that the personal condition of the applicant is of the first, and his family record of the second, importance are confirmed by Dr. Claud Muirhead,<sup>1</sup> who found that the records of the company of which he is medical officer showed that not more than 35 per cent. of the risks who died of consumption exhibited any family predisposition to tuberculosis. He, however, invites attention to the fact that the percentage is too small, because 88 per cent. of those insured entered the society below the age of forty, when their family histories were not completed, and it was most likely that a certain proportion of their families would die of tuberculosis.

From a medicolegal standpoint a court should, in justice to an insurer, insist on a strict construction of the warranties of the answers to the questions in regard to the existence of asthma, bronchitis, consumption, frequent or chronic cough, spitting or coughing of blood, and dyspepsia. Not infrequently in consequence of the desire of the attending physician to cause no alarm, or because of faulty diagnosis, a person who has incipient consumption has been told he has asthma or bron-

<sup>1</sup> The Causes of Death Among the Assured in the Scottish Widows' Fund and Life Assur. Soc. from 1874 to 1894 Inclusive, Edinburgh, 1902.

chitis. In the early stages of pulmonary tuberculosis a person may have a short, dry, hacking cough that has escaped his notice, or that may be regarded as a catarrh or clearing of the throat, and if there are certain associated conditions, such a cough should always be reported. A history of dyspepsia or of poor digestion for a long time, with loss of weight, is another important matter to elucidate. A rapid, weak pulse suggests some pulmonary lesion, when the examiner can eliminate the several other causes that give rise to this condition. The rise of a degree or more in the afternoon-temperature affords important corroborative evidence. The examiner should try to elicit these facts, especially in those who are light-weights, and record them, so that they may be duly weighed by the company's medical director.

Not infrequently individuals who are aware that they have incipient tuberculosis and who recognize that in the nature of things they are not likely to attain length of years, make effort to secure insurance in order to protect dependent relations. The financial resources of a life insurance corporation seem to be a Juggernaut that crushes out of existence all semblance of a conscience. The proponent possibly deems that the company buys his expectation of life, and if the company's medical examiner fails to detect the premonitory symptoms of the disease, then it is a case of *caveat emptor*. Careful examination has saved companies thousands of dollars, but the saving these have effected does not affect the loss occasioned by careless, ignorant, or even venal examiners. This statement is justifiable only in view of the actual fact that more than 50 per cent. of the consumption mortality of life insurance companies in the United States occurs within the first five years of insurance, a mortality-rate that is double the experience of the best English and Scottish companies.

One of the earliest legal cases in which concealment of the existence of consumption was made a defense, was one in which the court held: "The fact is established that at the time of making the proposal and issuing the policy the insured was rapidly declining in a confirmed consumption, and had been so declining for five months previous, and continued to live but two months after this time. Yet in answer to the tenth interrogatory the insured expressly denied that he or any of his family had been afflicted with pulmonary complaints, consumption, or spitting of blood. In answer to the seventeenth interrogatory, the insured said that he could not say that he was afflicted with any disease or disorder.

"It is immaterial that the insured did not suppose himself in a consumption; the fact was so, and the statement was manifestly contrary to the fact, which was a most material and conclusive fact. The fact of the general debility of the system, stated by the insured, was not important in the manner in which it was stated; as it might arise from a variety of causes not materially affecting the risk, and would not, therefore, by any means give the insurers the information wanted.

"The insured was asked directly whether he was at the time affected with any disease or disorder, and what it was; to which he answered

that he could not say that he was afflicted with any disease or disorder; but he could have stated the symptoms of consumption which he had, and which he had had for five months previous, and which were certainly most material and important to be known by the insurers. It is believed that omissions or concealments less important than this, and without any intentional fraud, have been held to avoid policies upon life. But it is not necessary to make this any part of the ground of the decision in this case; as the answer to the tenth interrogatory is so manifestly and most materially untrue that whether regarded as a warranty or a representation it must avoid this policy."<sup>1</sup>

An early distinction in the pathology of consumption was made in California in 1872, when the Supreme Court decided that "a tubercular affection of the lungs, or tubercles upon the lungs, or tubercles on the brain, or consumption, either of them constitutes a local disease, as matter of law, within the meaning of the word 'local,' when used by a life insurance company to an applicant for insurance, by asking him if he has a local disease."<sup>2</sup>

A case in which the evidence showed that the insured was treated for consumption and Koch's bacilli were found in the sputum was decided by a court of appeals to be a matter for determination by the jury rather than decision that there had been breach of warranty. In this action the defense was a breach of warranty by the insured in the false statement in his application that he never had consumption. The policy was issued on March 20th, and the insured died of acute tuberculosis on October 7th following. A physician testified for the insurer that in February, before the time of the application, he treated the insured for consumption, and at that time discovered the *bacillus tuberculosis* in the sputum. The presence of these bacilli was confirmed by another physician. A sister of the insured testified that in February the insured had suffered from a cold, but after treatment his cough disappeared and he was apparently healthy, and resumed his usual employment—that of laborer—and continued at it until within a few weeks of his death.

The medical examiner of the company testified that he made a thorough examination of the applicant on March 19th and found his lungs in a perfectly healthy condition; that he talked with the individual several weeks after the policy was issued, and saw nothing then to indicate any lung trouble or disease of any kind. The court, in view of this testimony, held that it was for the jury to determine whether the insured was afflicted with consumption when the insurance was issued.<sup>3</sup>

The subsequent history of the insured in this case confirmed the diagnosis made by the two physicians a month before the insurance was effected that he had pulmonary tuberculosis. This would seem to make

<sup>1</sup> *H. Vose vs. The Eagle Life and Health Ins. Co.*, 6 Cush., 42; see also similar decision *E. B. Miles vs. the Connecticut Mutual Life Ins. Co.*, 3 Gray, 580; *Horn et al. vs. the Amicable Mutual Life Ins. Co.*, 64 Barb., 81.

<sup>2</sup> *M. Scoles vs. The Universal Life Ins. Co.*, 42 Cal., 523.

<sup>3</sup> 16 N. Y. Sup. 953, affirmed; *Tucker vs. United Life and Accident Ins. Assoc.*, 133 N. Y., 548; *Rhode vs. Metropolitan Life Ins. Co.*, 88 N. W., 400 (Michigan, 1901).



the result of the examination in February a material fact, concealment of which in the application was a breach of warranty.

The more general use of the microscope in diagnosis enables a physician to inform a patient of the presence of tubercle bacilli in the sputum. But the only certain test the examiner would have for incipient tuberculosis would be the diagnostic administration of Koch's tuberculin, and the objection to its use for such purpose is apparent. It has been held that no recovery can be had on a policy in which the insured falsely stated in the application that he did not have consumption, even if death resulted from other causes, because the misrepresentation was in regard to a matter that increased the risk in the case of the person insured.<sup>1</sup>

**Diseases of the Eye.**—Ocular diseases may either cause certain helplessness which would increase the likelihood of accident, or it may be symptomatic of systemic diseases. A case was tried in which it was proved that some six years before the policy was applied for the deceased had an inflammation of the eyes, termed by the physician conjunctivitis. He was discharged from the army for this cause, but the condition had been cured for years. The insurance company sought to prove that the deceased had iritis at some period of his life, though that allegation was successfully controverted, and it made the defense of breach of warranty because of misrepresentation in regard to the former disease of the eyes. The insured committed suicide, in regard to which there was no proviso in the policy, and the court held that the company could not be permitted to set up as a defense a merely technical breach of warranty in regard to some trivial matter.<sup>2</sup> This decision commends itself for its fairness.

Myopia is not a bodily infirmity in the sense of those words as used in an application for life insurance.<sup>3</sup> Both of these decisions indicate that it would be unwise for an insurer to make a technical breach of warranty a basis for a refusal to pay a policy.

**Diseases of the Heart.**—Drs. Winston and Marsh found in their investigations that the mortality from heart disease increased directly with the years insured from a percentage of 3.18 in the first year to 8.88 in the period above ten years of insurance. They considered that the percentage during the first year was larger than ought to occur after a careful medical examination; however, these are not the only figures that indicate that medical examinations are too frequently made carelessly or incompetently. The medical officers of the Australian Mutual Provident Society reported that heart affections, next to phthisis, were the most fatal cause of death, especially in the advanced years of life. Dr. John Winters Brannan found that the average duration of the policy in risks that died of diseases of the heart and circulatory system, excluding apoplexy, was 10.86 years, while the general average duration of a policy was 8.54 years; 4.68 per cent. of the total deaths

<sup>1</sup> *Brown vs. Greenfield Life Assoc.*, 53 N. E., 129.

<sup>2</sup> *S. L. Fitch vs. American Popular Life Ins. Co.*, 59 N. Y., 557.

<sup>3</sup> *Cotton vs. Life Ins. Co.*, 41 Fed. Rpt., 506.

in the first five years of insurance, and 11.27 per cent. after ten years, were due to these diseases.

This large proportion of deaths in the early years of insurance must be the consequence of hurried examination. In a recent instance an applicant was recommended by an examiner in one of the largest cities in the United States, and was reported to be in good health. The company to which he applied learned that he had been rejected by another company because there was disease of the aortic valves, and declined to accept the risk. When the examiner learned this action he asked that, in justice to his reputation, the applicant should be re-examined. The second examination was then made by a gentleman connected with local hospitals and medical college, and he reported that the heart was normal. The applicant was examined a third time by a diagnostician of national reputation and unquestioned experience, who found that the heart was enlarged and pushed to the left by depression of the lower end of the sternum, and that there was a very decided mitral regurgitation. The expert said that he could appreciate the manner in which the applicant was passed when first examined because auscultation was pursued without the removal of the outer clothing, and at the second examination the physician's attention was directed altogether to the aortic murmur which was said to exist, and he was unable to find it because there was none. This case is not narrated because it is an unusual experience with life insurance companies, but simply because of the professional standing and experience of the physicians concerned in a case that rested on the detection of existing fact rather than of opinion.

Dr. Begbie found from the experience of the Scottish Widows' Fund Life Insurance Society that one-third of the persons with heart disease lived longer than their actual expectation of life,<sup>1</sup> but in general it may be said that such cases are too uncertain to be desirable risks.

Taylor refers to the case of *Huntley vs. The St. George Insurance Company*,<sup>2</sup> in which the facts showed that a medical man insured his life for £2000, and although it was certified that he was in good health, and appearances seemed to justify this, he died from Bright's disease three months subsequent to the issue of the policy. He had disease of the heart also. He denied that he had either of these diseases when he insured, but the company urged in defense that the insured was a physician, that he must have known of the existence of the diseases mentioned, and had concealed them. The jury returned a verdict for the plaintiff.<sup>3</sup>

In a case in which it was proved that the insured had heart disease for seven years previous to the date of his application for insurance the court held that as the answers in the application were warranted, the applicant assumed the risk if they proved to be untrue. "The existence of disease in an applicant for life insurance is the presence of the very peril that the company insures against. It is like insuring a build-

<sup>1</sup> Edinburgh Medical Journal, Dec., 1874.

<sup>2</sup> Newcastle Autumnal Assizes, 1858.

<sup>3</sup> Taylor, Medical Jurisprudence, p. 847.

ing already on fire. The question as to the health of the applicant is a preliminary one to ascertain if he is an insurable subject. The force of the stipulations and conditions above recited is to create a contract obligation on the part of the applicant that he was free from heart disease. He agreed that such peril and risk would not be encountered by issuing the policy, and if such peril did exist, the contract should not be operative. Proof of the existence of heart disease established a breach of the underlying contract upon which the policy rested."<sup>1</sup>

In an action on a life insurance policy the defense was breach of warranty by falsely representing that the insured had never suffered from certain diseases. The physician's certificate in the proofs of death stated that the deceased was afflicted with heart disease and had been ill for about one year when that physician was called to attend him. The court held that the inference from such statements was that the insured died of heart disease and that he had been afflicted with it for one year before his death.<sup>2</sup>

In an action on a life policy issued in April, 1894, it appeared that the insured stated in his application, in answer to questions, that he had not had disease of the heart; that about four months previously he had typhoid fever for about six or seven weeks, from which he had fully recovered; and that he was attended by Dr. D. The latter testified that the insured then had "a dilated weak heart"; that nobody could cure it; and he had it in April, 1894. His junior partner stated that he occasionally visited the insured, and he thought he had "neurasthenia and a weak heart." T., another physician, said that from an examination made in April, 1893, he thought there was slight paralysis of one side. Defendant's medical examiner reported that insured had no "intermittence or irregularity or undue strength or weakness in heart action," and that his chance of life appeared to be first class. Such report was sustained by his testimony, in which he explained the nature and extent of his examination, and that, as to the condition of the heart and lungs, it was thorough. Several of the insured's acquaintances testified that he appeared to be a strong and healthy man. It was held that the court could not say as a matter of law that insured had a weak heart when the policy was issued, or that his statement that D. attended him for typhoid fever was untrue.<sup>3</sup> Such a case brings up the unfortunate conflict of professional testimony, and would have to be decided by a jury. But where the physician can testify that he had treated an applicant for heart disease prior to insurance, his evidence cannot be discredited by the statements of witnesses that they knew the insured and the latter apparently was in robust health.<sup>4</sup>

In an action on a certificate of insurance one of the defenses was breach of warranty in that the insured falsely represented that he had never had heart disease. The only evidence that he had ever had heart

<sup>1</sup> *Powers vs. Life Assoc.*, 50 Vt., 630.

<sup>2</sup> *Proppe vs. Metropolitan Life Ins. Co.*, 54 N. Y. S., 172.

<sup>3</sup> *Smith vs. Metropolitan Life Ins. Co.*, 38 A., 1038, 1898.

<sup>4</sup> *Kipp vs. Metropolitan Life Ins. Co.*, 58 N. Y. S., 494.



disease was that ten months prior to his application the insured had an attack of la grippe, and while ill, stated that he wanted to arrange his affairs, as he had heart trouble seriously, and might die at any time. At the time of his application defendant was examined by a medical examiner and declared a good risk, and his intimate friends testified that insured was not known to have any heart trouble. It was held that the evidence was not sufficient to establish a breach of warranty or fraud in that insured had heart disease prior to his application for insurance.<sup>1</sup>

**Disease of the Kidneys.**—The experience of the Mutual Life Insurance Company showed that diseases of the kidneys caused a very small percentage of mortality during the earlier years of insurance, but there was a rapid increase in the later periods; the percentages were 1.87 for the former and 6.57 for the latter. In the earlier years of insurance the experience of the Washington Life showed that 3.92 per cent. of the mortality was due to renal disease, while in the later years the mortality was 7.59 per cent. This experience was corroborated by the Australian Mutual Provident Company, which found that the greater risk of death from kidney disease seemed to exist after fifty years. In this country Dr. Brannan found that the average age at death was 52.64 years.

Examination of the urine by chemical analysis affords the examiner evidence of the condition of the kidneys in general.<sup>2</sup> The most significant evidence of renal lesion is the presence of albumin, sugar, or pus in the urine. Albumin, as well as sugar, has been found in the urine of apparently healthy persons, and the records of life insurance offices have shown that individuals so affected were alive a decade after they had been rejected because of one or the other abnormality. Frequently an individual who has albuminuria or glycosuria will place himself under a physician's care, and after the treatment has moderated the symptoms he will visit the examiner for a life insurance company in the morning, when the urine is less likely to contain the abnormal product. Instances have occurred where the applicant has substituted the urine of a healthy person for his own.

An applicant for life insurance stated that he had no disease of the kidneys or bladder, and that he had not had any sickness within the last ten years. His family physician stated that he had two years previously prescribed for the applicant for bilious fever, and that the applicant had no symptoms of disease of the liver or kidneys or any organic disease. The applicant warranted his answers, yet it was proved that for some years previous to the time of application he had disease of the kidneys. The applicant's attending physician testified that he knew his patient's condition and told him that he (the physician) could not answer the company's questions truthfully and favorably; but as the company had once before received the applicant favorably, he would leave it with the company to take the risk or not, and answered the

<sup>1</sup> Metzradt vs. Modern Brotherhood of America, 84 N. W. 498 (Iowa, 1900).

<sup>2</sup> See Weber, Brit. Med. Jour., 1921, i, 78; Fox, Lancet, 1921, i, 116.

questions favorably for the applicant. The court decided the case in favor of the company on this exposure of the attending physician's duplicity and connivance at fraud.<sup>1</sup>

An insured, in answering questions in an application which he warranted, stated that he had never had kidney disease, and that he had not been attended by a physician within two years. By the contract the proofs of death were used as evidence against the insured, and a physician stated that less than two years prior to the application he had attended the insured for acute kidney disease, and that the insured died of Bright's disease complicated by uremia and pulmonary edema. It was held that the physician's evidence established the falsity of the answers, and as they were warranties, there could be no recovery.<sup>2</sup>

In another instance the insured represented in his application that his kidneys were in a healthy state and free from any tendency to disease. The Supreme Court held that as there was evidence to prove that the insured was suffering from kidney disease when he applied for insurance, and he knew the fact, it was an error for the trial court to refuse to instruct the jury that if the insured had kidney disease and concealed it when he took out the policy the latter was thereby avoided.<sup>3</sup>

The Appellate Term of the Supreme Court of New York decided a suit in which the insured died about seven weeks after the policy was issued, and it was proved that the insured, in his application, in answer to questions that were made warranties, stated that he was then in sound health and had never been sick or under treatment in any dispensary, hospital, or asylum, when he had been treated at the German Hospital for Bright's disease, and that at the time he was discharged from the institution, about six weeks before the date of the policy, he was not well. It was claimed for the plaintiff that because the insured had trouble with his eyes and could not see well, and the application was not read to him, he did not know what answers had been inserted, and it was not binding on the beneficiary. The Appellate Court held that the falsity of the answers constituted a breach of warranty and voided the policy, and reversed the judgment for the plaintiff given on the trial; because the assured was not illiterate; there was no fraud or mistake by the agent of the company, and there was an express warranty that the persons who prepared the application were to be regarded as the agents of the assured and that the company was not to be responsible for its preparation or anything contained therein or omitted therefrom. In this latter the court made a new and important ruling that the defendant had the right to protect itself in this manner against the effect of fraudulent acts, even of its own agents, and this provision in the application was valid and enforceable against the beneficiary.<sup>4</sup>

<sup>1</sup> *Britton vs. Mutual Benefit Life Ins. Co.*, 3 N. Y. S., 220.

<sup>2</sup> *Trudden vs. Metropolitan Life Ins. Co.*, 64 N. Y. S., 183, 1900.

<sup>3</sup> *Archibald vs. Mutual Life Ins. Co. of New York*, 38 Wisc., 542; also *Continental Life Ins. Co. vs. Young*, 113 Ind., 159; *Trudden vs. Metropolitan Life Ins. Co.*, 64 N. Y. S., 183, 1900.

<sup>4</sup> *O. Woehrlé vs. Metropolitan Life Ins. Co.*, Appellate Term, New York Supreme Court.

**Diseases of the Liver.**—The experience of the Australian Mutual Provident Society showed that 5.36 per cent. of the total deaths were due to disease of the liver, a result about double the experience of the Mutual Life, in which 2.81 per cent. of the total deaths were due to hepatopathies. The first-named company found that 23 per cent. of the deaths that occurred during the first five years of insurance were due to these diseases, and the medical officers said that it seemed “a very large proportion so soon after medical examination,” and is probably due to the necessary insufficient information which is obtained, notwithstanding the efforts of the office respecting the habits of proponents, and the slight attention which is too frequently paid by medical referees to the liver and digestive system generally.

The information in regard to the former existence of hepatopathies should include both functional and organic lesions of the liver, although it has been held that as jaundice and torpid liver are not organic diseases of the liver, the concealment of their former existence did not constitute a breach of warranty.<sup>1</sup> Recurrence of apparently functional disorders suggest some latent organic condition, although in this very matter a court has held that by the questions inserted in the application the insurer sought information that bore upon the risk which it was asked to take—the probable duration of the life of the applicant. It was proved that twice before the issuance of the policy the insured had been ill with congestion of the liver, though he withheld the information in his answer to a question in the application. The court held: “It was not seeking information as to merely temporary disorders or functional disturbances having no bearing upon general health or continuance of life. Colds are generally accompanied with more or less congestion of the lungs, and yet in such a case there is no disease of the lungs which an applicant for insurance would be bound to state. So most, if not all, persons will have at times congestion of the liver, causing slight functional derangement and temporary illness, and yet in the contemplation of parties entering into contracts of life insurance, and having regard to general health and continuance of life, it may be safely said that in such cases there is no disease of the liver.”<sup>2</sup>

An instance arose in England in which the insured had certified to his good health, as well as his ignorance of any disorder that would tend to shorten his life. In an action on the policy the insurer offered the evidence that the insured had concealed two severe bilious attacks which he had previous to effecting insurance. Medical evidence testified that the attacks did not tend to shorten life or to make the risk less favorable. Decision was against the company.<sup>3</sup>

**Diseases of the Lungs.**—The more material facts in reference to the influence of disease of the lungs on the subsequent health of the insured are referred to in the sections on consumption and spitting or coughing of blood.

<sup>1</sup> 6 New York Rptr., 376.

<sup>2</sup> *Cushman vs. United States Life Ins. Co.*, N. Y., 76.

<sup>3</sup> *Jones vs. The Provincial Ins. Co.*, Bigelow, Life and Accident, 2, 431.



A case occurred in England in which a woman upon whose life it was proposed to effect an insurance was represented to the insurers in December, 1822, by a medical man, to be in an ordinarily good state of health. This representation was repeated in March, and the insurance was effected in April, 1823. Between December, 1822 and March, 1823 she was ill with some disease of the lungs, but the fact was not disclosed. She died of pulmonary disease in April, 1824. The trial court failed to instruct the jury that information in regard to the illness was material to the insurers, so the superior court directed a new trial.<sup>1</sup>

A rather remarkable position was taken in an action on a policy which stipulated for a reduction of benefits in the event that the insured died in consequence of any pulmonary disease. The insured died of acute pneumonia, and the court held that it was proper to admit the testimony of physicians that, in common parlance, pneumonia was not considered a pulmonary disease, but that such diseases were of a more chronic and permanent nature.<sup>2</sup> It remains to be seen whether such a decision will receive further judicial support, although it was paralleled in an instance in which it was decided that the fact that the word "no" was given as the answer to the question in the application whether any relative had died of consumption or any pulmonary disease did not avoid the policy, though it was proved that a brother of the applicant had died of pneumonia some years before. This latter ruling was influenced by the technicality that the answers were written by the medical examiner, and the applicant, when questioned as to the cause of her brother's death, said that she did not know of what disease he died.<sup>3</sup>

These rulings would seem to be an invidious distinction against the insurer, as it is a matter of common experience both in the United States and Europe that applicants are aware that insurance companies attach importance to a history of tuberculosis of the lungs in a near relative, and they give the cause of death as catarrh, disease of chest, laryngitis, hemorrhage, childbirth, change of life, exposure, general debility, or unknown.

If the insurer does not ask for information in the application in regard to the prior existence of pneumonia, it cannot plead the concealment of such fact, because a person who applies for a policy of life insurance is required to disclose only such facts as are responsive to the questions asked.<sup>4</sup>

**Diseases of the Stomach.**—The applicant may be asked whether he has had disease of the stomach or dyspepsia, or both. A judicial decision has been rendered that an individual may have dyspepsia in its milder form and say that his health is sound without thereby making a misrepresentation.<sup>5</sup> It was decided in Illinois that where an in-

<sup>1</sup> 2 Bigelow, *Life and Accident*, 213.

<sup>2</sup> *Carson vs. The Metropolitan Life Ins. Co.*, 1 Pa. Sup. Ct., 572; also *Metropolitan Life Ins. Co. vs. Bergen*, 64 Ill., App., 685.

<sup>3</sup> *Alger vs. Metropolitan Life Ins. Co.*, 84 Hun, 271.

<sup>4</sup> *Iowa Life Ins. Co. vs. Zehr*, 91 Ill. App., 93, 1900.

<sup>5</sup> *Morrison vs. Wisconsin Odd Fellows' Mutual Ins. Co.*, 59 Wis., 162.

sured had suffered from dyspepsia for from six months to a year previous to insurance it was not conclusive evidence of a breach of warranty that he answered "no" to the questions in the application in regard to having had dyspepsia.<sup>1</sup> This latter decision seems quite remarkable in view of the correlated circumstances that the insured died within two months of the time when he acquired the insurance, and his attending physician testified that he had been in bad health for one and one-half years.

In a case in which the insured had denied that he had had any severe sickness or disease during the seven years that preceded the date of his application evidence was presented that within the time specified he had had gastritis. The court held that "unless chronic gastritis and gastritis are synonymous, as to which there is no judicial presumption nor testimony, the evidence was not within the issues, so that the false representation charged was not proved. In addition to this consideration we are not free from doubt as to whether gastritis was shown to be "a severe sickness-or disease."<sup>2</sup> This decision was apparently the consequence of poor management by the defendant, as it failed to present evidence that gastritis was a severe and even a fatal disease, while in its chronic form it seriously interfered with metabolism and general good health.

**Diseases of the Throat.**—But few decisions have been made in instances where there was question in regard to the existence of disease of the throat before the insurance was effected.

A clergyman stated in an application, which was the basis of contract for a policy issued to him, that the only sickness he had had within ten years was pneumonia, but said nothing of a slight attack of chronic pharyngitis within the time specified. The court held that the slight attack was an immaterial fact which the insured was not bound to disclose.<sup>3</sup> This decision is in accord with others which show that courts are not disposed to permit technical and comparatively trivial facts to constitute breaches of warranty.

It has been decided that an applicant for life insurance who, in answer to a question whether he ever had any illness, stated that he had had throat trouble, was not bound to state more particularly the nature of the trouble, no further question being asked.<sup>4</sup> Here the insurer had obviously deemed further information irrelevant.

A case occurred in which the insured was asked in regard to any disease for which a physician had attended him, and replied "never for sickness." An earlier application to another company was placed in evidence, and in this the insured said he had been treated for tonsillitis. The counsel for the beneficiary under the policy urged that tonsillitis was not a sickness within the meaning of the answer in the application. Expert evidence was presented to prove that tonsillitis was inflammation

<sup>1</sup> 5 Bigelow Life and Accident, 104.

<sup>2</sup> Price *vs.* The Phoenix Mutual Life Ins. Co., 17 Minn., 497.

<sup>3</sup> H. A. Wise *vs.* The Mutual Benefit Ins. Co. of New Jersey, 34 Md., 582.

<sup>4</sup> Mutual Reserve Fund Life Assoc. *vs.* Sullivan, 29 S. W. Reports, 190.

of the tonsils, and that a person who had it was much more liable to have his throat affected by colds than he would otherwise be; that it was likely to make a man quite ill and was oftentimes an indication of a scrofulous tendency. The insured was a physician, and that he believed tonsillitis was a disease was evidenced by his affirmative answer to the question of former disease in an earlier application. The policy was avoided because of this and other breaches of warranty.<sup>1</sup> Evidently in this case the judgment was based on the associated evidence of intentional and fraudulent breach of warranty, and not upon any impression that acute or chronic inflammation of the tonsils in an adult was likely to exert a prejudicial influence on the expectation of life of an insured person.

**Fits or Convulsions.**—These terms are used in their colloquial sense, because a layman might not know what epilepsy was and give a false answer. Applicants who have had epileptic seizures are not desirable risks, unless there were long intervals since the paroxysms occurred, and the personal and family history was otherwise untainted.

A case was tried in which the insured denied that he was subject to fits. It was proved that four years before the insurance was affected the insured had two seizures of an epileptic character which were the result of an accident. There was conflicting evidence in regard to the occurrence of subsequent fits up to the date of death. The court held that the policy was not voided by two fits of an epileptic character due to an accident, as the warranty referred to a person habitually or constitutionally afflicted with fits.<sup>2</sup> Such construction of the warranty is not justified by our knowledge of the clinical history of epilepsy.

In an instance in which the past existence of epilepsy was made a ground for defense by an insurer the relatives testified that the insured had not been troubled for twelve years previous to the issuance of the policy, and the court took the ground that epilepsy might be outgrown.<sup>3</sup>

**General Debility.**—The comprehensive term, "general debility," may be used both professionally and popularly to designate lessened vitality and serious impairment of one or more organs.

A man who was rapidly declining in a confirmed consumption, who had been declining for five months previous and continued to live but two months after the policy was issued, denied in his application that he or any of his family had been afflicted with pulmonary complaints, consumption, or spitting of blood. He said he had general debility. The court held that "the fact of the general debility of the system, stated by the insured, was not important in the manner in which it was stated; as it might arise from a variety of causes not materially affecting the risk, and would not, therefore, by any means give the insurers the information wanted."<sup>4</sup> This dictum of the court was quite just, although no company would be likely to accept an applicant who had

<sup>1</sup> *M. E. McCollum vs. The Mutual Life Ins. Co. of N. Y.*, 55 Hun, 103.

<sup>2</sup> *Chattock vs. Shawe and others*, 3 Bigelow Life and Accident, p. 10.

<sup>3</sup> *Dietz vs. Metropolitan Life Ins. Co.*, Pa. vs. Supreme Court, 1895.

<sup>4</sup> *H. Vose vs. The Eagle Life and Health Ins. Co.*, 6 Cush., 42.



such a condition without a full explanation of the symptoms, duration, and termination of the trouble.

**Headache.**—Information in regard to the frequent occurrence of headache is of material importance, as such a history would direct more scrutinizing attention to the condition of the kidneys, liver, and the nervous system. When an applicant for insurance answered “no” to the question whether he had headache, it has been decided that the answer was true, though when overworked the individual was subject to that malady.<sup>1</sup>

A case occurred in which the insured had been asked by the medical examiner whether he had ever had any difficulty with his head or brain, and a negative answer was given. It was proved that he had severe attacks of headache; but the court held that the questions as put by the medical examiner referred to “some functional or organic derangement of the head and brain, some disease or ailment affecting the brain and mental powers,” and not “to occasional headaches, whether arising from indigestion, a derangement of the stomach or bowels, or other cause.”<sup>2</sup> It is hardly necessary to state that the learned judge’s definition of headache is incorrect.

**Hernia.**—An applicant for insurance stated that she was “in good health, not being afflicted with any disorder, external or internal,” and also said she had no rupture. In an action it was proved that at the date when insurance was effected she had a small swelling in the groin, which was a symptoms of rupture, although the insured did not know it, and she died of hernia. The court held that her statement in regard to her health was not a warranty that she had no disease, known or unknown, but merely that, so far as within her own knowledge, she had none. Her failure to disclose the material fact of a swelling in the groin was not a ground for voiding the policy, because the insured did not know it was material, and it could not be expected that a person who had no medical knowledge would appreciate its materiality.<sup>3</sup>

In a case in which the insured denied that he had rupture in reply to the query in the application it was proved that he was ruptured twice previous to the date of the application. The trial judge declined to charge the jury that the answer was false, but left it to decide the question whether the rupture was material to any question of soundness of health of the individual when insured. The United States Supreme Court reversed the decision because of the falsity of the answer.<sup>4</sup>

A trial court decided that a question in an application for life insurance—“Are you ruptured, and, if so, do you wear a well-fitting truss?”—related to the time of the application; and where there was evidence that the applicant had suffered from strangulated hernia during the year previous to his application, but had recovered before that time, it was for the jury to determine whether he was ruptured when

<sup>1</sup> Mutual Life Ins. Co. of N. Y. *vs.* Simpson, 28 S. W. R., 837.

<sup>2</sup> A. Higbie *vs.* Guardian Life Ins. Co., 53 N. Y., 603.

<sup>3</sup> Life Association of Scotland *vs.* J. Foster, 4 Bigelow, 520.

<sup>4</sup> Aetna Life Ins. Co. *vs.* D. France, 1 Otto, 510.

he applied for insurance. The jury decided against the company, but on appeal it was held that a negative answer to such a question was a misrepresentation.<sup>1</sup> It would seem that the decision of the trial judge was correct, for the query referred to in the application relates to the existence of hernia at the time of the application. The counsel for the defense did not apparently make the contention that there was material concealment of past illness, when the applicant failed to state that he had been operated on for strangulated hernia when he was interrogated by the examiner in regard to the existence of any severe injury or illness.

**Inflammatory Rheumatism or Rheumatism.**—Inflammatory rheumatism as well as gout is not infrequently a precursor of heart disease, and a knowledge of its existence is a matter of serious importance to a life insurance company. So, too, muscular rheumatism is the result of deficiency or aberration in metabolism, and it is desirable for the insurer to have knowledge of it.

Dr. Claud Muirhead<sup>2</sup> found that in a series of deaths from rheumatism the decedents had survived less than one-third of their anticipated after-life, a source of great pecuniary loss to a company. About one-fifth of the cases were complicated with heart disease, about one-eighth with meningitis, and one-third had a history of attacks of rheumatism previous to that which ended fatally.

A case was tried in which the insured had denied the past existence of rheumatism when he made his application, and testimony was introduced that showed he had subacute rheumatism prior to that time. There was evidence that subacute rheumatism was not the disease rheumatism in the ordinary understanding of the term, as well as evidence to the contrary. The court held that "the rheumatism referred to in the question is the *disease* of rheumatism. Any rheumatic affection not amounting to the *disease* of rheumatism is not comprehended in its terms any more than the spitting of blood occasioned by a wound of the tongue or the extracting of a tooth is the *disease* of 'spitting of blood' mentioned in the same question. The life insured had the right to answer the question upon the basis that the terms were used in their ordinary signification. If there was any ambiguity in the question so that its language was capable of being construed in an ordinary, as well as in a technical sense, the defendant can take no advantage from such ambiguity."<sup>3</sup>

In a more recent decision the Appellate Division in New York reversed a decision in favor of a beneficiary rendered by a lower court. The answers made by the insured in his application for membership in an assessment company were made warranties, and he stated that he had not been attended by a physician and had not consulted one professionally for two years, and at the time the consultation was for a cold. It was proved that four months previous to his application the insured had been attended by a physician for articular rheumatism

<sup>1</sup> *Levie vs. The Metropolitan Life Ins. Co.*, 39 New Eng. Rptr., 792.

<sup>2</sup> *Op. cit.* See foot-note page 1134.

<sup>3</sup> *D. and L. D. Price vs. The Phoenix Mutual Life Ins. Co.*, 17 Minn., 497.

affecting the knee. The physician testified that he did not know that the insured had rheumatism.

The trial court was asked by the defendant to charge that any untrue statement made by the insured that he had not been attended by or had not professionally consulted a physician for over two years was a breach of warranty, and on such untrue statements the plaintiff could not recover. The court answered: "I refuse to charge it, unless for a medical attendance: if the medical attendance was for some affair so trifling as not to come within the definition of disease to be treated by a physician." The Appellate tribunal held that this was an error. The fact of disease had nothing to do with the question. It was the professional consultation in regard to the insured's physical condition. It might be that the physician would discover that there was no disease, whereas the patient thought he had one. Still it would be a breach of the warranty, because there would be the professional consultation.

**Insanity.**—The question of insanity is so clearly associated with breach of warranty or forfeiture of contract because of suicide that reference has been made to the subject in the section on Suicide.

It was decided that where a policy exempted the insurer from liability in case of suicide, and provided that in the event of the insured's "death by his own hand or act, whether sane or insane," the insurer was liable only for the premiums paid, the failure of the defendant to present evidence that would refute the plaintiff's evidence that the insured's death was caused by insanity entitled the plaintiff to a directed verdict for the full amount of the policy.<sup>1</sup>

It has also been decided that suicide of the insured is not a breach of warranty in the application that he will not "die by his own hand," if, at the time of suicide, the reasoning faculties are so far impaired that the insured is unable to understand the moral character, general nature, consequences, and effect of the act, or where he is impelled thereto by an irresistible insane impulse.<sup>2</sup>

In an action on a life insurance policy it will not be held as a matter of law that the insanity of a parent of the insured at the time the application for insurance was made was in unsound condition of health. In substance the question was: "What is the condition of the health of your mother?" The answer was: "Sound." At the time of the application the mother was in Binghampton Lunatic Asylum on account of chronic mania, and at times she was violent, obscene, and profane. The attending physician testified in regard to the mother that she was in a fair physical condition when admitted to the asylum, and at the time of the application for insurance she was eating and sleeping well, except that she had periods of mental disturbance. By withdrawing the case from the jury both parties to the suit treated the question as one of law, and it remained for the court to determine, as a legal question, whether an insane person was necessarily in unsound physical con-

<sup>1</sup> Waycott *vs.* The Metropolitan Life Ins. Co., 64 Wallace, 221.

<sup>2</sup> Insurance Company *vs.* Terry, 15 Wallace, 580; Mutual Life Ins. Co. *vs.* Leubrie, 18 C. C. A., 332.



dition. No evidence was presented to show that an insane person was considered by physicians as in an unsound condition of health, and the court held that it possessed no expert knowledge that enabled it to solve the question as one of fact. It held that mere mental aberration would not constitute ill health; and that the extent to which mental disturbance would destroy or interfere with the functions of the body must depend upon the circumstances of each case.<sup>1</sup>

The word "insane" as used in an application or policy has been held to imply every degree of unsoundness of mind, and the liability of the insurer is not affected by the degree of insanity.<sup>2</sup>

Many companies have a clause in the application or the policy by which there is exemption of liability in case of suicide, whether committed when sane or insane. It has been held that in a suit on an insurance policy which contained this clause it is not necessary, in order to avoid liability, to show that a person taking his own life was conscious of the moral quality or consequences of the act, but only that he knew the physical nature and consequences of the act; that is, he knew that the means employed would cause death or endanger his life.<sup>3</sup>

**Paralysis** affords an indication of pre-existing disease of the nervous system, and whether it is the result of an infantile or adult disorder impairs the desirability of a risk.

An insured died of paralysis within a year of the time the policy was issued. In his application he denied that he ever had paralysis. Proof was given that, prior to the attack which ended fatally, he had two attacks within a year, the second of which occurred within four months of the date of his application. The court held that "both attacks were, in point of fact, of a seriously alarming character, and were evidently so considered by his physician, by his neighbors, and by himself. His statement in the application was manifestly untrue. The inquiry called for an answer of undoubted materiality and importance, and the party should be held to the consequences of a false answer. Therefore, by express stipulation, the policy issued upon the application which contained this false statement was void."<sup>4</sup>

**Piles.**—Inquiry is made in the application in regard to the existence of piles, because these may be symptomatic of disease of the rectum or of the liver or of some of the adjacent pelvic viscera.

An applicant for insurance stipulated that his answers and statements should be taken as warranties, and the certificate of insurance contained a clause that it should be null and void if any of the statements in the application were false. It was proved that the applicant falsely stated in the application that he had never had piles. The court

<sup>1</sup> Jacklin *vs.* National Life Assoc. of Hartford, Supreme Court New York, February 15, 1893.

<sup>2</sup> Spruill *vs.* Northwestern Mutual Life Ins. Co., 120 N. Y. City, 414; Brower *vs.* Supreme Lodge, National Reserve Assoc., 74 Mo. App., 490.

<sup>3</sup> Nelson *vs.* Equitable Life Assur. Soc. of the United States, 73, Ill. App., 113; see also Sargent *vs.* National Life Ins. Co., 41 Atl. Rptr., 351; Parish *vs.* Mutual Benefit Life Ins. Co., 49 S. W., 153.

<sup>4</sup> Barteau *vs.* Phoenix Mutual Life Ins. Co., 3 N. Y. Supreme, 576.

held that there could be no recovery on the certificate, although the insured's death did not result from the piles, and although he was ignorant that he had them.<sup>1</sup>

**Spitting or Coughing of Blood.**—The phrase “spitting or coughing of blood” is used in many applications in lieu of the scientific term “hemoptysis,” as the latter might not be understood by a layman who would not be at a loss to comprehend what the first terms signified.

An insured died of consumption three years after the policy was issued, and it was proved that about three years before the policy was effected he had spit blood and had subsequently exhibited other symptoms usual in consumptive subjects. The trial court misdirected the jury, as it was left to them to consider whether the spitting of blood was of such a nature as to endanger life. A new trial was ordered. One judge said: “By ‘spitting of blood’ must, no doubt, be understood a spitting of blood as a symptom of disease tending to shorten life; the mere fact is nothing; a man cannot have a tooth pulled without spitting blood. But, on the other hand, if a person has an habitual spitting of blood, although he cannot fix the particular part of his frame whence it proceeds, still, as this shows a weakness of some organ which contains blood, he ought to communicate the fact to the insurance company, for no one can doubt that it would most materially assist them in deciding whether they should execute the policy; and good faith ought to be kept with them. So if he had had spitting of blood only once, but that once was the result of the disease called spitting of blood, he ought to state it, and his not doing so would probably avoid the policy.”

Another judge said: “By the expression ‘spitting of blood’ is no doubt meant the disorder so called, whether proceeding from the lungs, the stomach, or any other part of the body; still, however, one single act of spitting of blood would be sufficient to put the insurers on inquiry as to the cause of it, and ought, therefore, to be stated.”

A third judge in this case ruled: “I have no doubt that if a man had spit blood from his lungs, no matter in how small a quantity, or even had spit blood from an ulcerated sore throat, he would be bound to state it. The *fact* should be made known to the office in order that their medical adviser might make inquiry into its cause.”<sup>2</sup>

In a recent case the judge announced that this question was limited to such spitting or coughing of blood as a reasonable person might suppose would indicate some ill health or physical condition that affects the applicant's desirability as a risk.<sup>3</sup> As spitting of blood is always abnormal, this interpretation conflicts with experience.

A case was tried in which the facts were proved that while the insured in his application denied that he had spit blood, in fact, he had raised blood from two to two and a half years prior to and down to his death, which occurred three months after his policy was issued. A

<sup>1</sup> Baumgart *vs.* Modern Woodmen of America (Wisc.), 55 N. W. Rptr., 713.

<sup>2</sup> Goach *vs.* Ingall, 2 Bigelow, Life and Accident, 306.

<sup>3</sup> Peterson *vs.* Des Moines Life Assoc., 87 N. W., 397 (Iowa, 1901).

referee rendered judgment against the defendant, but the general term of the Supreme Court set aside the judgment, and the Court of Appeals ordered judgment absolute for the defendant.<sup>1</sup>

In a recent case in which the evidence showed that an insured had answered "no" to the question "Have you ever spit blood?" and other evidence showed that there had been considerable spitting of blood, it was held that the question had been falsely answered and that the jury should have been so instructed.<sup>2</sup> In this case the plaintiff sought to make a distinction between hemorrhage and spitting of blood, because the first was not asked about, but the court held the one included the other.

**Sunstroke.**—This is a comprehensive term including the various phases of heat prostration, and it is used in the application in a colloquial sense. If there is no inquiry made in regard to the past existence of sunstroke, it has been held that "the omission of the defendants to interrogate the assured specifically, whether he had been afflicted by 'sunstroke' or 'pneumonia,' furnishes some evidence that those diseases were not 'serious' ones within the contemplation of the parties to the contract, and there is no evidence that the assured acted in bad faith in giving his answer to the question put to him on this subject." In this case the fact of sunstroke was communicated to the agent of the company who received the application, and he told the assured it was not necessary to state it in the application.<sup>3</sup>

As a rule, however, all applications ask whether the applicant ever had any other disease than those specifically mentioned, so that it would be necessary to mention as important a disease as sunstroke.

**Syphilis.**—The rule of life insurance companies varies in regard to the matter of accepting applicants who give histories of syphilis. Some do not accept those who have been thus infected; others, basing their conclusions on the curability of syphilis as maintained by Fournier and other syphilographers, accept such risks if there is a history of satisfactory treatment and five years or more have elapsed since the date of the last symptom; others accept such risks with extra charge for the impairment. From a medicolegal standpoint, the question of a former syphilitic infection is a matter of great import, because of the influence of that disease in causing locomotor ataxia, paresis, tumors of the brain, and disease of the arteries that cause various organic maladies.

There are few diseases that are so important in their influence on the viability of the person infected that exist as does syphilis in a period of inactivity that is free from any appreciable symptom. So if the applicant chooses to conceal from the examiner that he had such infection, and answers "no" to the inquiry, the examiner must depend upon the truthfulness of the reply.

<sup>1</sup> *C. F. Smith vs. The Aetna Life Ins. Co.*, 3 Bigelow, 708; see also *Foot vs. Aetna Life Ins. Co.*, 4 Bigelow, 204; *Smith vs. Northwestern Mutual Life Ins. Co.*, 46 A., 426 (Pennsylvania, 1900).

<sup>2</sup> *March vs. Metropolitan Life Ins. Co.*, 186 Pa. State Rpt., 629.

<sup>3</sup> *Boos vs. World Mutual Life Ins. Co.*, 4 Hun, 133.



Recently the writer had under observation an instance in which an insured told the examiner not only that he had never had syphilis, but had never been treated by a physician. Evidence was obtained that a year and a half before effecting the insurance he had been treated by four physicians for syphilis of the brain, and had symptoms of loss of consciousness, speech disturbance, loss of power of the muscles of an extremity, and treatment for the condition at Hot Springs, Arkansas.

In a cause it was proved that an applicant stated that the only disease he had had was typhoid fever; that the attending physician had from time to time given the insured prescriptions, that he had been treated for syphilis for four years, and these facts were concealed from the insurer. The judgment of the lower court in favor of the plaintiff was reversed by the Supreme Court, because it was contrary to the evidence that the applicant had made untrue statements.<sup>1</sup>

**The Use of Wine, Spirits, or Malt Liquors.**—Correct information in regard to an applicant's habits in the use of wine, spirits, or malt liquors is a matter of great importance, both on account of the effect of alcohol on the organs and tissues of the body, as well as in consequence of the influence of drinking on any inherited tendency to disease. Most companies make inquiry in regard to this matter, and some of the English companies accept total abstainers at a lower rate than drinking men.

Some American companies contract that the use of intoxicants forfeits the policy if the insured should die within a year or two years in consequence of intemperance; and in some, after a year the reserve and interest are payable only if death is due to alcoholic excess. Death "in a state of intoxication or from any accident or violence received while in that state, or from any disease caused by stimulants or narcotics, is a risk not assumed, and if delirium tremens or any injury to or impairment of the health be caused by them, the policy is wholly terminated, but the company will return the reserve."

Most companies require the applicant to state in effect whether he has ever drunk to excess. This question would seem to be sufficiently explicit to convey its meaning to an intelligent mind, and yet it has been the writer's experience that competent physicians would record the negative reply of an applicant who would be noticeably intoxicated on an average of once a month, nor would the examiners apprise the company of such facts by any confidential communication on the subject. When taxed with such dereliction they would state that they had not supposed that the question was intended to include occasional intoxication. This misinterpretation of the apparently obvious signification of words in every-day use has been paralleled in court in a case in which in answer to the question "Do you ever drink wine?" etc., the applicant replied "Not at all." The appellate judge decided that the finding that this answer was true was warranted by evidence that the insured occasionally drank to excess, though he did not drink habitually.<sup>2</sup>

<sup>1</sup> Mutual Reserve Fund Life Assoc. *vs.* Opp, 30 S., 69 (Mississippi, 1901).

<sup>2</sup> Mutual Life Ins. Co. of N. Y. *vs.* Simpson, 28 S. W. Rptr., 837.

Such a decision so manifestly at variance with the meaning of the terms of the contract was reversed by the State Supreme Court.<sup>1</sup>

In another case an applicant for a policy answered the question, "Do you drink beer, ale, wine, or spirits? If so, state what, how often, and how much," by "Yes, two or three glasses of beer daily." The court held that the answer was a representation that the applicant did not drink any spirituous liquors.<sup>2</sup>

In a case in which the applicant had stated, in reply to interrogatories, that he was of sober, temperate habits and had not taken a drink for over a year, the company refused to pay on the ground of intemperance and breach of warranty. The court held that the representations of the insured in his application that he was a man of temperate habits and had not taken a drink for over a year was material to the risk and constituted a warranty. A warranty that the applicant was of sober and temperate habits meant not only that he was so at the time of the application, but for so reasonable a time prior thereto as would allow one to form a habit.<sup>3</sup>

In another instance the insured, who died of delirium tremens within four months after taking out his policy, stated in the application that he had always been temperate and that he had last consulted a physician about one year previously for a slight attack of influenza. When the attending physician was placed on the witness-stand his evidence showed that the insured had been under his professional care at various times during the five years preceding his death, and the last time was some four months before the application, for nausea and vomiting consequent upon overdrinking. The court held that there was such a breach of material warranty in the application as to require a judgment in favor of the company as a matter of law.<sup>4</sup>

Not only has testimony in regard to the insured's habits before death been accepted, but even the evidence of the cause of death. In an action on a policy which was conditioned to be void if the insured should become so far intemperate as to impair his health, the court decided that the complaint should be dismissed in a case in which the affidavit of the cause of death showed that the remote cause was alcoholism, although it also stated that the immediate cause was alcoholism and extreme prostration.<sup>5</sup>

When an applicant for insurance, in answer to the question to what extent he used alcoholic stimulants, answered "none," the court held that proof of the single instance of the use of liquor was insufficient to make that answer untrue. In order to prove this latter it would be

<sup>1</sup> *Mutual Life Ins. Co. vs. Simpson*, 31 S. W. Rptr., 501.

<sup>2</sup> *Malicki vs. Chicago Guaranty Fund Life Society*, 77 N. W., 690 (Michigan, 1899).

<sup>3</sup> *The Mutual Life Ins. Co. of N. Y. vs. Gividen*, Ky. Superior Court, 1896.

<sup>4</sup> *Menzel vs. Northwestern Mutual Life Ins. Co.*, 176 Pa. St., 280; see also *Miller vs. The Mutual Benefit Life Ins. Co.*, 34 Ia., 222; *Rainger vs. Boston Mutual Life Assoc.*, 167 Mass., 109.

<sup>5</sup> *Hanna vs. The Connecticut Mutual Life Ins. Co.*, 28 N. Y. Sup., 661; see also *G. Holterhoff vs. The Mutual Benefit Life Ins. Co.*, 4 Bigelow, 395.

necessary to present tenable evidence of the insured's habit or custom to use such stimulants.<sup>1</sup>

"Under a general statute, Chapter 22, Section 22, which provides that no statement in an application for insurance, unless fraudulent or material, shall prevent a recovery on the policy, false statements as to previous habits of drinking are not material unless they existed to such an extent as to affect the health or physical condition of the applicant."<sup>2</sup>

A life insurance company issued a policy in 1890 upon the life of an individual, to be paid to his wife upon his death. The policy provided that if the insured shall "become so intemperate as to impair his health or induce delirium tremens, said company shall have the unquestioned right, upon becoming satisfied of such fact, to terminate this contract immediately upon the tender to the party in interest of the legal reserve." After three or four years the company refused to receive further premiums and claimed that the policy was cancelled. The Appellate Division affirmed the judgment given in the Monroe Supreme Court in favor of the beneficiary in her suit to recover upon the policy, the court holding that the above-quoted provision did not constitute the company the sole judge as to whether or not the insured had become so intemperate as to impair his health, and that it was proper for the trial judge to submit to the jury the question whether that was the case at the time the company attempted to forfeit the contract of insurance. In his application for the policy the insured stated in answer to one of the questions that he used alcoholic stimulants moderately, and the Appellate tribunal held that it was not improper for the trial court to charge the jury on the question as to whether decedent's intemperance aggravated the Bright's disease of which the insured died, and to instruct that the terms of the contract did not preclude the insured from drinking moderately.<sup>3</sup>

This decision is in accord with that in which a supreme court sustained a trial court that declined to instruct the jury that if the death of the insured was due to intemperance, or if it was hastened by the intemperate use of intoxicating drinks, or if it resulted from such excessive use, the plaintiff could not recover from the insurer. This court said: "It is immaterial whether Reichard's death was occasioned by intemperance or not. If he was at the time of issuing the policy, and at the time of renewal thereof, temperate and in good health, then it cannot be said that he made false representations to the company, without which the risk would not have been taken. The risk was taken upon the statements made at the time of issuing the policy, and had no reference to any future change in the habits of the insured. If R. became intemperate subsequent to the issuing and renewal of the policy, and this fact could be set up in bar to a recovery, we see no reason why intemperance in eating, the undue exposure of the person to the in-

<sup>1</sup> Grand Lodge A. O. U. W. *vs.* Belcham, 33 N. Eng. Rptr., 886; see also D. A. Mowry *vs.* The Home Ins. Co., 9 R. I.; Supreme Lodge of Knights of Pythias *vs.* Foster, 59 N. E., 877 (Indiana App., 1901).

<sup>2</sup> Mutual Life Ins. Co. of New York *vs.* Thomson (Ky.).

<sup>3</sup> D. Janneck *vs.* The Metropolitan Life Ins. Co.



clemency of the weather, or any other act tending to shorten life might not with equal propriety be pleaded in bar.”<sup>1</sup>

An insured stated in his application that he was a man of temperate habits and had always been so; in trial to enforce the payment of the policy the family physician of the insured testified that when the insurance was effected the insured was drinking hard, that he had attended him for delirium tremens, and once or twice for indisposition produced by the excessive use of intoxicating drink, and that he regarded him as a man of intemperate habits. The physician admitted that he did not know the insured intimately, and had only professional relations with him. Two other witnesses testified that they knew that the insured was an intemperate man, and had frequently seen him under the influence of liquor. Other witnesses testified that the insured was a man of temperate habits. The Circuit Court found in favor of the beneficiary, and the case was taken to the United States Supreme Court. That body delivered the following opinion, apparently without dissent: “The question was as to the habits of the insured. His occasional use of intoxicating liquors did not render him a man of intemperate habits, nor would an exceptional case of excess justify the application of this character to him. An attack of delirium tremens may sometimes follow a single excessive indulgence. Ray, in his treatise on *Medical Jurisprudence*, says that ‘though it most commonly occurs in habitual drinkers, after a few days of total abstinence from spirituous liquors, it may be the immediate effect of an excess or series of excesses in those who are not habitually intemperate as well as in those who are’ (Sec. 545). In the *American Encyclopedia* (vol. v, p. 782), under the head of ‘Delirium Tremens,’ it is stated that it ‘sometimes makes its appearance in consequence of a single debauch’; though commonly it is the result of protracted or long-continued intemperance.

“When we speak of the habits of a person we refer to his customary conduct, to pursue which he has acquired a tendency from frequent repetition of the same acts. It would be incorrect to say that a man had a habit of anything from a single act. A habit of early rising, for example, could not be affirmed of any one because he was once seen on the streets in the morning before the sun had risen; nor could intemperate habits be imputed to him because his appearance and actions might indicate a night of excessive indulgence. The court did not, therefore, err in instructing the jury that if the habits of the insured, ‘in the usual, ordinary, and every-day routine of his life, were temperate,’ the representations made are not untrue, within the terms of meaning of the policy, although he may have had an attack of delirium tremens from an exceptional overindulgence. It could not have been contemplated from the language used in the policy that it should become void for an occasional excess by the insured, but only when such excess had by frequent repetitions become a habit. And the testimony of the witnesses, who had been intimate with him for years and knew

<sup>1</sup> *W. Reichard vs. The Manhattan Life Ins. Co.*, 31 Mo., 518; also *C. N. Horton vs. The Equitable Life Ass. Soc.*, 2 Bigelow, 108.

his general habits, may well have satisfied the jury that, whatever excesses he may at times have committed, he was not habitually intemperate."<sup>1</sup>

Several insurance companies have endeavored to protect themselves from untimely death losses by a stipulation that the insurer should not be responsible under the policy contract if the health of the insured should become impaired by the use of narcotics or alcoholic, vinous, or malt liquors. It has been held that this stipulation amounts to a promissory warranty on the part of the insured, and a breach thereof will work a forfeiture of the policy.<sup>2</sup> Where such a warranty has been made the plaintiff has attempted to maintain that drunkenness is a disease, but the court has held that the fact that drunkenness is a disease, and that a return to dissipation is a recurrence of a disease over which the person has no control does not prevent such recurrence from being a breach of a promissory warranty in an insurance contract not to use liquors to excess.<sup>3</sup>

All insurance companies inquire whether the applicant has ever been treated for alcoholism. A judgment in favor of the plaintiff by a lower court was reversed in favor of the company in an issue of the truth of the statement in the application that the insured had never been treated for the alcohol habit, when there was testimony of physicians that they had treated him therefor; such testimony was not contradicted by testimony that the insured was a temperate man.<sup>4</sup>

#### HEALTH AT THE TIME OF THE APPLICATION

An invariable question in the life-insurance application is one in regard to the health of the applicant at the time he applies for a policy. The answer to this question is usually made a warranty, consequently a false answer thereto in the application is a breach of warranty that will violate the policy.<sup>5</sup> It has been decided that the words "good health" mean nothing more or less than what they usually and commonly mean, and it is for the jury to say whether or not the insured was in good health at the time of the application.<sup>6</sup>

A case occurred in which it was proved that just before his application the insured, who died of cerebrospinal meningitis, had called on a physician on account of a slightly disordered stomach that was speedily relieved. The court refused—and it seems very properly—to rule that he should have disclosed this fact in his application. In this case the court charged that if the applicant had a disease that proved fatal later

<sup>1</sup> *Knickerbocker Life Ins. Co. vs. Foley*, 105 U. S., 350.

<sup>2</sup> *Waters vs. Supreme Conclave Knights of Damon*, 31 S. E., 155 (Georgia, 1898).

<sup>3</sup> *Northwestern Life Assur. Co. vs. Bodurtha*, 53 N. E., 787 (Ind. App., 1899).

<sup>4</sup> *Home Life Ins. Co. vs. Sibert*, 31 S. E., 519 (Virginia, 1898).

<sup>5</sup> *Weil vs. New York Life Ins. Co.*, 47 La.; *Levi vs. Ins. Co.*, 163 Mass., 117; *Murphy vs. Association*, 90 Wisc., 206; *Travelers Ins. Co. vs. Lampkin*, 5 Col. App., 177; *Mutual Life Ins. Co. of New York vs. Simpson*, 88 Texas.

<sup>6</sup> *Swick vs. Home Life Ins. Co.*, 2 Dill., 160; *Swift vs. Massachusetts Mutual Life Ins. Co.*, 2 N. Y. Sup. Court, 3028; *Edington vs. Aetna Life Ins. Co.*, 77 N. Y., 564; *Gratton vs. Metropolitan Life Ins. Co.*, 92 N. Y., 274.

on, and that was a serious disease, it would be immaterial that it was in its first stages, and that the applicant did not regard it of consequence. Good health meant a state of health free from any disease that affected seriously the general soundness of the system.

### ATTENDING PHYSICIAN

All applications contain a question which is intended to elicit information in regard to the medical treatment of the applicant. Concealment of a visit to a physician by the proposer has been held to avoid the policy,<sup>1</sup> and many ingenious pleas have been made as to what constitutes an "attending physician" or "to consult a physician." The Supreme Court of Arizona held that to be one's physician meant "to attend upon him or consult with him in a professional capacity about his state of health"—that is to say, to prescribe treatment, if necessary, and give directions and advice calculated to relieve from sickness and restore to health.<sup>2</sup> Similarly it has been defined that a person who calls at a physician's office, submits to an examination, receives advice for his ailment, and subsequently calls again to consult the physician professionally and pays him a fee, is "attended" by such physician within the meaning of the question, "By what physician were you last attended?" as used in an application for life insurance.<sup>3</sup>

It certainly would not be urged that there was any honest reason to conceal such information, and the courts have held that when the answers to the questions propounded by the medical examiner are made warranties, and these questions include a query, "When and by what physician were you last attended, and for what complaint?" it is a breach of warranty that avoids the policy for the applicant to answer that he never called a doctor in his life if it is proved that he was attended by a physician, though for a trifling sickness.<sup>4</sup> Such decisions seem to be in accord with the evident terms of the contract; yet courts have decided that even where a life insurance policy provided that if any statements in the application were in any material respect untrue, the company might cancel the policy, it would not be construed as a warranty that would avoid the policy if there was a false statement in the application to the effect that the applicant had not required the services of a physician for seven years.<sup>5</sup>

From a medical standpoint it is just as essential for the company to have a correct record of the proponent's health preceding the time of

<sup>1</sup> *British Equitable Assur. Co. vs. Great Western Railway Co.*, 38 L. J., N. S. 132, 314 Ch.

<sup>2</sup> *Mutual Life Ins. Co. of New York vs. Arkelger*, U. S. Rptr., 1895.

<sup>3</sup> *White vs. Provident Savings Life Assur. Soc. of New York*, 39 N. E. Rptr., 771; see also *Cobb vs. Benefit Assoc.*, 153 Mass., 176; *Cushman vs. Life Ins. Co.*, 70 N. Y., 72.

<sup>4</sup> *Provident Savings Life Ins. Soc. vs. Reutlinger*, 58 Ark., 528; see also *Mutual Life Ins. Co. vs. Arkelger*, U. S. Rptr., 1895.

<sup>5</sup> *Union Central Life Ins. Co. vs. Pauley*; Appellate Court of Indiana, Nov. 1, 1893; see also *Life Ins. Co. vs. Schultz*, 73 Ill., 586; *Plumb vs. Pennsylvania Mutual Life Ins. Co.*, Mich., 65 W. R., 611; *Hubbard vs. Mutual Reserve Fund Life Assoc.*, 100 F., 719 (Rhode Island, 1900).



application as to have cognizance of other data referred to in the application blank; and it would be difficult to select any warranty that is more important than that in regard to the employment of a medical attendant.

It has also been decided that where the question demanded the name of each physician who had attended the applicant within a given period, and the answer gave the name of but one when more than one physician had been employed within the specified time, the concealment of the names of the other physicians was a breach of warranty that vitiated the policy.<sup>1</sup>

Efforts have been made to interpose the provisions of a state law that related to the materiality of a representation, but it was decided that a false answer by an applicant for life insurance as to whether he had consulted, or obtained the advice of, or was prescribed for by, any other physician within ten years of his application, was a material representation, within a statute (Act June 23, 1885, Pa. P. L., 134), which provided that where a warranty in an application was not material to the risk the company could not make defense against the policy on account of its breach.<sup>2</sup>

**Family History.**—In an application for life insurance an insured made certain statements of material facts touching his family history, and further stated that each of such statements was true, and that no omission, concealment, or mental reservation had been made of any material fact as to his family history. The insurance policy stated that it was issued in consideration of the application, the statements made therein, and the warranty by insured of their truth; and the insured, in writing, accepted the policy on those considerations. In any action by the beneficiary under the policy a special verdict was returned, which found that the statements as to the family history of insured were untrue, but that there had been no intentional omission, concealment, or mental reservation by insured in so stating. It was held by the Wisconsin Supreme Court that there could be no recovery on the policy.<sup>3</sup>

In another instance an applicant, who warranted his answers, stated to the medical examiner that he had five sisters, aged respectively fifty-two, fifty, forty-seven, forty-five, and thirty-six years; their ages were, in fact, respectively, forty-nine, forty-six, forty-four, thirty-six, and thirty-three years. The Texas Supreme Court held that the provisions of the policy constituted a warranty of the truth of the statements in the application, and that the discrepancies forfeited the contract.<sup>4</sup> This impresses one as a very rigid construction of the law of warranty, because the man had five sisters, and there was in each instance such immaterial difference between the actual and the stated age that it

<sup>1</sup> *Brady vs. United Life Ins. Assoc.*, U. S. Rptr., 1895; *Caruthers vs. Kansas Mutual Life Ins. Co.*, 108 F., 487 (Arkansas, 1901).

<sup>2</sup> *Wyman vs. Fidelity Mutual Life Assoc.*, 17 Pa., Co. Ct. R., 259; *Fidelity Mutual Life Assoc. of Philadelphia vs. McDaniel*, 57 N. E., 645 (Indiana Appel., 1900).

<sup>3</sup> *McGowan vs. Supreme Court of I. O. F. of Toronto, Canada*, 83 N. W., 775, 1900.

<sup>4</sup> *Kansas Mutual Life Ins. Co. vs. Pinson*, 63 S. W., 531, 1901.

would have made no difference to the medical director in arriving at an opinion.

### WOMEN AS RISKS

It has been only within recent years that the life insurance companies in general have adopted a more liberal policy as regards the acceptance of women as risks. The published mortuary experience of the Mutual Life Insurance Company of New York reported that from 1843 to 1874 the female risks constituted about 3 per cent. of the whole number of persons insured,<sup>1</sup> and of the 101,967 insured lives, 5385 males and 161 females died during the period specified.<sup>2</sup> Later investigations by this company<sup>3</sup> showed that in 46,525 deaths there were 1540 females, 3.31 per cent. for the entire period, although the rate during the last four years of the period was 4.65 per cent. The experience with females reversed that with males, the former giving the greater number of deaths under forty-five and the fewest over sixty years. Deaths from diseases of the respiratory and the genito-urinary organs were more numerous among female than male risks. Likewise in the Washington Life Insurance Company, Dr. Brannan wrote: "The deaths of males only are considered, those of females, 68 in number, being too few for profitable analysis."<sup>4</sup>

Also in the Australian Mutual Provident Association there were 110,299 lives exposed, of whom 104,326 were men and 5973 were women, during the forty years from 1849 to 1888, of these 5325 men and 221 women died during the time specified. The annual mortality rate was 0.82 per cent. among the men and 0.84 among the women.<sup>5</sup>

The objection to the acceptance of women as risks has been as much from the actuarial as from the medical side of life insurance. Hopf maintained that there was no doubt that a greater proportion of females who assured their lives at the younger ages died early. "The deviation is too significant and too constant to be considered accidental. We are not able to explain it by any other supposition than by the circumstance that women feel internal hidden infirmities and defects in a higher degree than men, and have a presentiment of approaching danger in consequence of that, which impels them to insure their lives; or that they understand better and more skilfully than men to hide the true state of their health and to deceive by it even their medical men."<sup>6</sup> It is not probable that women are more keen to recognize existing disorders than men, but it is a fact that it is rare that an examiner is able to make as thorough an examination of a woman as of a man. How otherwise is it possible to reconcile the disparity between the status of a woman as a risk and as an annuitant? Mr. R. W. Weeks wrote: "It

<sup>1</sup> Actuarial Statistics, p. 4.

<sup>2</sup> Medical Statistics, p. 5.

<sup>3</sup> Report on the Mortality Records of the Mutual Life Insurance Company of New York from 1843 to 1898, New York, 1900.

<sup>4</sup> The Washington Life Ins. Co., Historical, Actuarial, and Medical Statistics, N. Y., 1889, p. 96.

<sup>5</sup> Report on the Mortality Experience of the Australian Mutual Provident Assoc., Sydney, 1891.

<sup>6</sup> Jour. Inst. Act., vi, p. 5.

is a singular fact that the three annuity experiences here compared agree in showing a very low mortality, rate among females under the age of fifty, the ratios to the mortality among males under that age being as follows:

American companies.....	57 per cent.
British Government annuities.....	59 “
French annuitants.....	63 “

This low mortality among the younger female annuitants cannot be attributed to chance, since the exposure under age of fifty in the three experiences aggregate over 36,000 lives for one year. This result is in startling contrast with the experience of the companies on insured female lives, such lives under the age of fifty showing a mortality much in excess of the male.”<sup>1</sup>

When the applicant is a woman she is questioned in regard to the present or past existence of menstrual disorder, uterine or ovarian disease, and affection or tumor of the breast. She is asked whether she has borne children, whether she has had an abortion or trouble in labor, whether she is pregnant, or whether she has passed the climacteric.

A woman within a short period of her confinement was examined for insurance, and the concealment of a fact material to the risk was urged in opposition to the payment of the claim. The court held that the insurer did not allege that the lives of married women were not insured by them, or that the perils of childbirth were not covered by the policy. No warranty against it was in the policy, and none of the questions required to be answered seemed intended to reach it. The certificate of the physician selected by the company was given in evidence, and aware, as he ought to have been if he performed his duty, of the situation of the woman, he repeated to the company that the life was a good one. She was a young woman, and it did not appear but that she was a vigorous woman. She had already borne one child in safety, so that there was no constitutional impediment. In insuring the life of a young married woman for the whole term of her natural life the company must be presumed to know that, in the ordinary course of things, it is a peril she must expect frequently to encounter. Was this then a fact material to the risk? This is a question which the jury are to decide. If material, was it concealed?<sup>2</sup> In the absence of any specific question in reference to the existence of pregnancy, there was not the slightest ground for the insurer to contest the payment of the claim on the ground that there had been concealment of a material fact.

<sup>1</sup> “Monetary Mortality Experience on Annuities in American Life Ins. Companies,” Trans. Act. Soc. of America, 1892.

<sup>2</sup> *Lefavour vs. Insurance Company*, 2 Bigelow, 158.



# THE MEDICAL JURISPRUDENCE OF ACCIDENT INSURANCE

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THE Supreme Court of Pennsylvania has defined an accident as "an event that takes place without one's foresight or expectation; an event which proceeds from an unknown cause or is an unusual effect of a known cause, and therefore not expected."<sup>1</sup>

A policy of accident insurance has been defined as an agreement to indemnify the insured for disability or death caused by external, accidental, and violent means; and some have maintained that each and all of these factors must be shown to exist to enable the insured to recover. James Briggs Porter, Esq., takes a very logical view of the idea of indemnification: "An agreement to compensate a man for injuries by accident might seem to be a contract of indemnity; but it must be remembered that in this case, as in that of an insurance on a man's own life, the value of the peril insured against cannot be appraised in money, and therefore the insured cannot really be indemnified; for although the evil results of bodily injury can often be alleviated by what money will procure, mere money cannot allay or remove the suffering, and therefore cannot really constitute an indemnity."<sup>2</sup>

Dr. Elias J. Marsh, in a monograph entitled *Mortality from Casualties*, reviews the mortality experience of the Mutual Life Insurance Company and states that "the proportion of deaths from casualties compared with the total mortality is far less now than formerly, but this difference is chiefly due to the difference in the ages of the company's risks. In the earlier records the proportion of elderly persons was very small; the business was new business, and consequently there was little accumulation of old lives. Among old lives other natural causes of death preponderate and the casualties are reduced to a small proportion, although they may be as numerous when compared with the lives at risk as they were at an earlier age." Dr. Marsh's investigations showed that in order of frequency fatal casualties were caused by: (1) Railroad accidents; (2) falls and falling bodies; (3) drowning; (4) injuries due to horse and wagon; (5) homicide; (6) firearms; (7) poisons; (8) heat, cold, etc.; (9) burns, scalds, etc.; (10) machinery, tools, elevators.

Accident insurance policies have been defined as including "horse

<sup>1</sup> North American Life and Accident Co. *vs.* Burroughs, 69 Pa., 43.

<sup>2</sup> The Laws of Insurance, London, 1884.

or vehicle policies," or "automobile policies," which insure an employer against liability for accidental injuries to others than employees, and which are caused by horses, vehicles, or automobiles of the insured; "elevator policies," which insure against accidental personal injuries caused by elevators or their appurtenances; "general liability policies," which insured against liability for accidental personal injuries to any persons other than employees or persons injured by elevators, for which the insured may be liable as landlord or tenant; and "outside liability policies," which insure builders and contractors against liability for accidental personal injuries to workmen employed by other contractors and to the public, which may be caused by the insured or by his workmen.<sup>1</sup> While this decision indicates the wide range of accident insurance, the present paper is intended to deal only with that phase of the subject that pertains to suits at law in which some medical feature is concerned.

It may be said that the fundamental grounds for contest of an accident insurance policy are that the accident was the consequence of the reckless or intentional act of the person insured, or it was in part or wholly due to existing disease afflicting that person, or the injury was due to the intentional act of a third person. Provisions of an accident insurance policy should be applied strictly against the insurer, in order that the indemnity purchased should not be defeated.<sup>2</sup> Occasionally contests have arisen on the ground that death was the ultimate result of an accident, as in a case in which the policy provided that the company would be liable only for injuries through external, violent, and accidental means which should immediately and wholly disable the insured from transacting business. The insured sustained a fall, but for two months was able to attend partly to business, when at the end of that time he was incapacitated by a stroke of paralysis which was the direct result of the accident. The court held that the company was not liable under the conditions of the policy.<sup>3</sup> It is evident that the paralysis was not an immediate and complete disability, so recovery on the policy could not be expected.

It has been decided that the loss of one's fingers or hand does not ordinarily constitute total disability.<sup>4</sup>

**The Application.**—The application for accident insurance gives the individual's name, age, residence, and occupation; the height and weight; the amount of insurance to be paid in the event of death; the amount of weekly indemnity; the name, residence, and relationship of the beneficiary; the amount of accident insurance in force and the names of the companies or associations in which it is placed; there is a statement in regard to rejection for such insurance or cancellation of a policy or payment of indemnity. The applicant warrants the truth of

<sup>1</sup> *Employers' Liability Assoc. vs. Merrill* (Mass.), 29 N. Eng. Rptr., 529.

<sup>2</sup> *McElfresh vs. Odd Fellows' Acc. Co. of Boston*, 52 N. E., 819 (Ind. App., 1899).

<sup>3</sup> *Merrill vs. Travelers' Insurance Co.*, Wisconsin Supreme Court, 1895.

<sup>4</sup> *Hutchins vs. The Supreme Tent of the Knights of the Maccabees of the World*, 68 Hun, 355.

the answers to these questions, and also that he never had fits or disorders of the brain, that his habits of life are correct and temperate, and that he has no physical or mental infirmity.

**Warranty and Representation.**—The questions of warranty and representation are virtually the same from an accident as from a life insurance standpoint. A misrepresentation by the insured in his application for accident insurance as to his occupation, on the truthfulness of which representation the policy is conditioned, avoids the policy.<sup>1</sup> But, as in life insurance policies, the accident company is bound by the acts of its agent if he misrepresents the applicant's vocation. "A classification of the applicant's occupation by a general agent of the company, who has been fully informed as to the fact, is binding on the company."<sup>2</sup> This ruling is made broader in a decision that a person authorized by a mutual accident association to procure applications for membership is deemed the agent of the association in all that he does in preparing the application, and his failure to state all the facts pertaining to the risk disclosed by the applicant is the error of the association and not of the applicant.<sup>3</sup>

The accident insurance companies are protected in many states by special legislation against fraud. Any applicant, officer, agent, solicitor, examining physician, surgeon, or other person who knowingly or willfully makes any false or fraudulent statements or representations in or with reference to any application for membership or reinstatement or any other documentary or other proof for the purpose of obtaining or reinstating membership in or benefit from any fraternal beneficiary society, order, or association, any corporation, association, or society transacting the business of life or casualty insurance or both . . . is guilty of misdemeanor.<sup>4</sup>

**Policy.**—The terms of the policy contract to indemnify the insured in a certain amount against loss of time for a limited number of weeks, provided that such loss results from bodily injuries effected during the time the policy is in force; and that the injury was through external, violent, and accidental means, which shall, independently of all other causes, immediately and wholly disable him from transacting any and every kind of business pertaining to his occupation. The words "wholly disabled from the prosecution of his usual employment" in an accident policy mean inability to do substantially all kinds of his accustomed labor to some extent. To recover in such case the assured must be deprived of the power to do to any extent substantially all kinds of labor which constitute his usual employment.<sup>5</sup>

In general the policy provides that if a loss by severance of one entire hand or foot results from such injuries alone within a specified

<sup>1</sup> *Murphy vs. American Mutual Accident Assoc.*, 62 N. W. Rptr., 1057.

<sup>2</sup> *New York Accident Ins. Co. vs. Clayton*, 59 Fed. Rptr., 559; also *Carpenter vs. American Accident Co.*, 24 S. E., 500.

<sup>3</sup> *Whitney vs. National Masonic Mutual Accident Assoc.*, 59 N. W. Rptr., 943; see also *Howe vs. Provident Fund Soc.*, 7 Ind. App., 586.

<sup>4</sup> New York Penal Code, 577a.

<sup>5</sup> *G. W. Sawyer vs. Casualty Co.*, 1 Bigelow, 289.



number of days, the insurer will pay the insured a portion of the principal sum named in the policy in lieu of the weekly indemnity; or in the event of loss by severance of two entire hands or feet, or one entire hand and one entire foot, or loss of entire sight of both eyes, or of death within a specified number of days in consequence of injuries, the insurer will pay the insured the full principal sum.

The terms of the policy further provide that if the insured is injured in any occupation or exposure classed by the insurer as more hazardous than that specified in the application, his insurance shall be only for such sums as the premium paid by him will purchase at the rates fixed by the insurer for such increased hazard.

**Health of the Insured.**—The words “disease” or “bodily infirmity,” as used in a provision in an accident policy which exempts the insurer from liability for injuries caused by such conditions, mean practically the same thing, and include only an ailment or disorder of a somewhat established or settled character, and not merely a temporary disorder which arises from some sudden and unexpected derangement of the system, though it produces unconsciousness.<sup>1</sup> When such conditions exist in the terms of the policy, it has been held, however, that the insurer is not liable if, at the time of the accident, the insured was suffering from a pre-existing disease, and death would not have resulted from the accident in the absence of such disease, as the insured died because the accident aggravated the disease or the disease augmented the effects of the accident.<sup>2</sup>

Such cases as these would afford an opportunity for a considerable difference of opinion, and must be determined by the weight of expert testimony. The following instance illustrates this point: In an action on an accident insurance policy the court held that the jury was warranted in finding that a fall was the sole cause of death of the insured, where there was testimony that the insured was usually in good health until the time of the fall and had shown no symptoms of degeneracy of the brain. Dr. P., who attended the deceased daily after his fall, and Dr. R. testified that the necropsy showed a contusion of the cerebellum, which culminated in an effusion of blood on the brain, producing apoplexy and death, and that in their opinion the contusion was caused by the fall. Dr. H., who assisted at the necropsy, testified that there were degeneration of the cerebrum and diseased condition of the arteries, which latter was of long standing and caused independently of the fall. Dr. O., who was called for the defendant, agreed with Dr. H. as to the cause of death if the latter's diagnosis was correct.<sup>3</sup>

In a suit somewhat similar to the last mentioned, in which the policy provided that the benefits should not extend to death caused by bodily infirmity or disease, it appeared that the insured suddenly fell, striking his head. There was no evidence of any external cause for the fall, and

<sup>1</sup> *Meyer vs. Fidelity and Casualty Co.*, 65 N. W., 328.

<sup>2</sup> *National Masonic Accident Assoc. vs. Shryock*, 73 Fed. R., 774; also *Commercial Travelers' Mutual Accident Assoc. of America vs. Fulton*, 24 C. C. A., 654.

<sup>3</sup> *Hall vs. American Masonic Accident Assoc.*, 86 Wisc., 518.

the necropsy showed general disease of the heart and brain, which caused the fall and death. The court held that an affirmative instruction for the defendant was properly given by the lower court.<sup>1</sup>

A case similar to that first cited in this section was one in which the court held that death due to drowning in consequence of a temporary trouble to which the insured was not subject, but which was entirely unusual and uncommon, whereby the insured fell into the water, was accidental within the meaning of an accident insurance policy.<sup>2</sup> Assumedly the court believed if the unconsciousness had chanced to occur while the insured was in his own home or bed, the fatal drowning could not have occurred. In this case the court held that an anemic murmur, which did not indicate a structural defect of the heart but was caused simply by a temporary debility or weakened condition of the body, was not within the meaning of the term "bodily or mental infirmity," in an application for accident insurance in which the applicant states his freedom from such infirmities.

A case occurred in which the insured, when a boy, received injuries from which he recovered so that there was no increased tendency to accidental injury because of them, nor did they contribute to the accident which resulted in his death. The court held that his policy was not forfeited by a statement in his application that he had never been physically injured or subject to bodily or mental infirmity or disease, because the insured was entitled to a liberal construction in his favor.<sup>3</sup>

The evidence of the physician or surgeon is necessary to prove that there was a bodily injury; that it occurred in consequence of external, violent, and accidental means; and that it wholly disabled the insured; and necessarily each case must rest upon its intrinsic merits.

**External Means.**—There has been difference of opinion in regard to what constitutes *external* in the sense in which the word is used in an accident policy. In a case in which an accident policy provided compensation for "any injury caused by violent, accidental, external, and visible means," and which contained a proviso that the insurance should not cover injury which arose from natural disease or weakness, the insured stooped to pick up a marble, and in that act he dislocated the cartilage of his knee. Previously he had never had any injury to or weakness in that joint, and the court held that in the policy the word "external" was used in contradistinction to an internal cause, such as disease, and that, therefore, the injured person could recover an indemnity from the company.<sup>4</sup>

In another instance in which the terms of the policy provided that benefit thereunder should not extend to disability caused by any injury of which there was no external or visible sign, the court held that the injury contemplated need not be visible to the eye, and the protection

<sup>1</sup> Sharpe vs. Commercial Travelers' Mutual Accident Assoc., 37 N. E. Rptr., 353.

<sup>2</sup> Manufacturers' Indemnity Co. vs. Dorgan, 7 C. C. A. Rptr., 581.

<sup>3</sup> Standard Life and Accident Ins. Co. vs. Martin, 33 N. E. Rptr., 105.

<sup>4</sup> Hornlyn vs. The Crown Accidental Ins. Co., 1 Queen's Bench, 750.

afforded by the policy extended to a strain of the recti muscles, which could be ascertained by a physician by the sense of feeling by means of the hands applied to the exterior of the body.<sup>1</sup> When it is recalled that the majority of fractures are not visible to the eye, or that there may be laceration of a viscus due to a fall with no external evidence of a lesion, the justice of the foregoing rulings may be appreciated. Evidently it is the intent that the courts will allow the various methods of diagnosis employed by physicians to be introduced in evidence of the existence of an accidental injury.

Discoloration of the arm and shoulder satisfies the provision of an accident policy that there be a visible mark on the body.<sup>2</sup>

An assured went to Council Bluffs in 1884 and died there in less than two months after. He was employed at first as a bookkeeper in a meat market, and later as a check-clerk in the transfer department of the Union Pacific Railroad. It was shown that carloads of hides frequently passed that station, and that a large number of cattle were brought there to be slaughtered in the vicinity, although there was no positive proof that the insured ever came in immediate contact with the hides or even the flesh of these animals. The insured died of malignant pustule. A majority of the court held that "there cannot be the slightest doubt that malignant pustule is regarded generally, by those who have but the usual acquaintance with such matters, as a disease." The medical witnesses had defined malignant pustule as a "pathologic condition" following the inroad of a particular bacillus. The court held that "the definition given by the physicians for the plaintiff as to the difficulty being a pathologic condition of the body and not a disease is upon these facts entirely too fragile to base a recovery upon, and the distinction between a disease and a pathologic condition of the body is, with reference to this case, much too refined for common acceptance. It seems to me clear that the meaning of the words used in the policy covers just such a case, and that the parties never intended that a cause of death, which to all outward appearances and to the world in general was a disease, should be converted into a 'pathologic condition' of the body caused by an accident."<sup>3</sup>

From this decision it would appear that the interpretation of an accidental cause of disease will not be allowed to attach to the bite of a fly or a mosquito. Insect-bites are said to have caused cholera, yellow fever, malaria, bubonic plague, glanders, and anthrax, so that the risk of accident insurance companies would be materially increased if death from those diseases could be ascribed to an accidental cause.

More recently it has been held that death caused by the sting of an insect is a death produced by external, violent, and accidental means, within the meaning of an accident policy. And such blood poisoning is not the consequence of "poison in any form or manner" or of "con-

<sup>1</sup> *Gale vs. Mutual Aid and Accident Assoc.*, 66 Henry, 600; see also *Freeman vs. Association*, 156 Mass., 351.

<sup>2</sup> *Thayer vs. Standard Life and Acc. Ins. Co.*, 41 A., 182 (N. H., 1896).

<sup>3</sup> *S. N. Bacon vs. The United States Mutual Accident Assoc. of the City of New York*, 123 N. Y., 304.



tact with poisonous substances within the meaning of those terms as used in an accident policy."<sup>1</sup>

Death of an insured will not be held accidental merely because it results from the rupture of an artery as he reaches to close a window, it not appearing that anything was done or occurred which he had not foreseen and planned, except the rupture.<sup>2</sup>

**Some of the Causes of Accidental Death.**—Death due to fright has been held to be accidental.<sup>3</sup> Death by drowning is accidental even when the insured is in bathing.<sup>4</sup> Death from peritonitis caused by a violent blow on the stomach is an accident;<sup>5</sup> but death from erysipelas brought about by a wound from a cut was held to be the result of the disease rather than of the wound.<sup>6</sup> Death by lynching is an accident within the meaning of a policy insuring against bodily injuries sustained through external, violent, and accidental means.<sup>7</sup> Death from a pistol shot fired by another person is an accidental death, even if the shooting is intentional.<sup>8</sup>

The decisions in regard to erysipelas are at variance with our knowledge of the etiology of this disease, and at variance with the decision that where virulent matter, which produces blood poisoning, is communicated to a wound coincident with its infliction, and death is produced thereby, it is a death within a policy clause which provides that the insurance shall not extend "to any case except where the injury is the proximate and sole cause of the disability or death."<sup>9</sup> The writer cannot but believe that in the future it will be generally accepted by the courts that erysipelas following an accidental wound was a consequence of the latter, and that the insured will receive the protection for which he pays, just as he would for any other form of septicemia due to injury.

In a case of septic infection the court held that it was a question for the jury whether the injury of an insured was caused by external, violent, and accidental means within the meaning of an accident policy, where it was the result of inflammation caused by the use of a hypodermic needle, with which the plaintiff administered medicine to himself for extreme exhaustion, and the attending physician testified that he did not think that the medicine injected by plaintiff caused the inflammation, but that it was caused by the puncture.<sup>10</sup> That the accident insurance companies recognize that there is a feature of accident in septic or purulent infection is evidenced by the fact that the policies which

<sup>1</sup> *Omberg vs. United States Mutual Association*, 40 S. W. Rep., 909.

<sup>2</sup> *Feder vs. Iowa State Traveling Men's Assoc.*, 78 N. W., 252 (Iowa, 1899).

<sup>3</sup> *McGlinchey vs. Fidelity and Casualty Co.*, 80 Me., 251.

<sup>4</sup> *Trew vs. R. P. Assoc.*, 6 H. and N., 839; *Mallory vs. Travelers' Ins. Co.*, 47 N. Y., 53; *Knickerbocker Casualty Co. vs. Jordan*, 11 Ins. Law Jour., 475.

<sup>5</sup> *North American Life and Accident Co. vs. Burrough*, 69 Pa., 43.

<sup>6</sup> *Smith vs. Accident Ins. Co.*, Law Rpts., 5 Excheq., 302; *Young vs. Accident Ins. Co. of North America*, 6 Law Rpts., Sup. Ct., Montreal, 3.

<sup>7</sup> *Fidelity and Casualty Co. vs. Johnson*, 17 So., 2.

<sup>8</sup> *Supreme Council, Order of Chosen Friends, vs. Garrigus*, 104 Ind., 133; *Hester vs. Fidelity and Casualty Co.*, 69 Mo. App., 186.

<sup>9</sup> *Martin vs. Manufacturers' Accident and Indemnity Co.*, 45 N. E., 377.

<sup>10</sup> *Bailey vs. Interstate Casualty Co.*, 40 N. Y. S., 513.

they issue to physicians usually cover the risk incidental to such infection acquired while operating or in postmortem examinations.

It was decided that when blood poisoning resulted from an abrasion of the skin of a toe by a new shoe, and death was caused thereby, such death was properly attributed to a "bodily injury effected by external, violent, and accidental means."<sup>1</sup>

**Asphyxiation.**—Death from asphyxiation, whether by natural or by illuminating gas, is due to accident.<sup>2</sup> Some of the accident companies phrased their policy forms to read that the insurance did not cover injuries, fatal or otherwise, which resulted from poison or anything accidentally or otherwise taken, absorbed, or inhaled, but the courts have held that accidental asphyxiation by illuminating gas which escaped into the room where the insured slept was not within such clause in a policy.<sup>3</sup>

But a contrary view has also been taken, and it was decided in one instance, at least, that the terms of the policy exempted the insurer from liability in case of gas asphyxiation.<sup>4</sup>

Whatever may be the ultimate consensus of judicial opinion in regard to gas asphyxiation, there should be unanimity in regard to the fact that strangulation consequent upon accidental occlusion of the larynx while swallowing is purely an accident. Where the insured chokes to death while attempting to swallow a piece of beefsteak that accidentally lodged in his windpipe, death resulted from violent and accidental means within the meaning of the condition of the policy.<sup>5</sup>

**Sunstroke.**—While the mortuary nomenclature of several municipalities includes sunstroke as a cause of death by accident, it has been decided that it is not an accident, but a disease.<sup>6</sup> The English court held that a disease produced by "known natural cause" could not be considered as accidental; while the American court ruled that medical text-book writers classed sunstroke as a disease of the brain, and that the sun's rays were not essential to cause the condition.

**Hernia.**—This has been so frequently a basis for a claim against an accident insurance company that most companies have excluded it by the terms of the contract. Yet in a case in which the policy indemnified against death resulting from external, violent, and accidental means, but expressly stipulated that the insurer was not to be liable when death resulted "wholly or partially, directly or indirectly, from hernia," the court held that where the insurer, in running against a door-knob, so injured his groin that hernia resulted and eventually death, the insurer was liable notwithstanding the terms of his policy.<sup>7</sup> In another case

<sup>1</sup> *Western Commercial Travelers' Assoc. vs. Smith*, 29 C. C. A., 223.

<sup>2</sup> *Pickett vs. Pacific Mutual Life Ins. Co.*, 144 Pa., 79; *Paul vs. Travelers' Ins. Co.*, 112 N. Y., 472.

<sup>3</sup> *Fidelity and Casualty Co. vs. Waterman*, 44 N. E. Rpt., 283; *Lowenstein vs. Fidelity and Casualty Co.*, 88 Fed. Rptr., 474.

<sup>4</sup> *Richardson vs. Travelers' Ins. Co.*, 46 Fed. Rep., 843.

<sup>5</sup> *American Accident Co. vs. Reigart*, 23 S. W. Rptr., 191.

<sup>6</sup> *Sinclair vs. Maritime Passenger Assur. Co.*, 3 Ellis and Ellis, 478; *Dozier vs. Fidelity and Casualty Co.*, 46 Fed. Rptr., 446.

<sup>7</sup> *Miner vs. Travelers' Ins. Co.*, 30 Ohio, Dec., 289.

the court decided that hernia brought on by an accidental fall was an accident within the terms of the policy.<sup>1</sup>

Where a blacksmith, who was a hale and hearty man, and accustomed to the use of a sledge-hammer, immediately after striking a slanting blow with a sledge-hammer was seized with a pain in his abdomen, and it was discovered that he had sustained a rupture, which injury caused his death, the question whether the injury was covered by a policy insuring him against bodily injury effected through "external, violent, and accidental means" was for the jury.<sup>2</sup>

Where an accident policy insures against such bodily injuries, of which there shall be visible marks on the person, as are effected solely by external, violent, and purely accidental means, and insured, who was a hostler helper in a railway shop, while lifting a truck, gave down and soon died by reason of hernia, plainly showing visible marks on his person, such death was accidental within the meaning of the policy.<sup>3</sup>

But a hernia caused by jumping from a car and running, done voluntarily and for the accomplishment of a certain purpose, and unattended by any falling or stumbling, does not constitute an injury caused by accident.<sup>4</sup>

**Suicide.**—The position of the courts in regard to the question of suicide is evidenced in an action on an accident policy where the defense was that the deceased committed suicide, and it was decided that the burden of establishing such a defense was on the defendant.<sup>5</sup>

In another instance it was held that a policy of insurance against "bodily injuries effected through external, accidental, and violent means," and occasioning death or complete disability to do business, but excepting "death or disability caused wholly or in part by bodily infirmities or disease, or by suicide or self-inflicted injuries" covered death while hanging one's self while insane. The court said: "If self-killing, suicide, dying by his own hand, cannot be predicated of an insane person, no more can 'self-inflicted injuries,' for in either case it is not his act."<sup>6</sup>

If the policy exempted liability for suicide, whether the insured was "sane or insane," the court decided that suicide while insane was within such exception.<sup>7</sup>

Where death may be attributable to suicide, accident, or sickness, the presumption of the law is against suicide.<sup>8</sup> Deceased, insolvent, was heavily insured. It did not appear that he was subject to fits. He invited a friend to go boat-riding, promising a pleasant time. The

<sup>1</sup> *Tilton vs. Accidental Death Ins. Co.*, 17 Common Bench, N. S. 122; *Travelers' Ins. Co. vs. Murray*, 16 Col., 296.

<sup>2</sup> *Atlanta Acc. Assoc. vs. Alexander*, 30 S. E., 939 (Georgia, 1898).

<sup>3</sup> *Summers vs. Fidelity Mutual Aid Assoc.*, 84 Mo. App. 605, 1900.

<sup>4</sup> *W. L. Southard vs. The Railway Passengers' Assur. Co.*, 1 Bigelow, 70.

<sup>5</sup> *Whitlatch vs. Fidelity and Casualty Co.*, 71 Hun, 146; *Inghram vs. National Union*, 103 Iowa, 395.

<sup>6</sup> *Accident Ins. Co. vs. Crandal*, 120 U. S., 527.

<sup>7</sup> *Billings vs. Accident Ins. Co. of North America*, 64 Vt., 78.

<sup>8</sup> *Burnham vs. Interstate Casualty Co. of New York*, 75 N. W., 445, 1898; also *Fidelity and Casualty Co. vs. Weise*, 80 Ill. App., 499, 1899.



friend declining, he went alone. He was seen rowing in a circle after his hat, and, in reaching for it, fell out. He called for help several times, threw up his hands, and was swimming rapidly to catch the boat. When overtaken he was floating dead on the water, face down. Experts testified that if he was swimming, death was probably due to drowning; and as the abdomen was distended with gases which might be due to indigestion, that would account for the body's not sinking. It was held that the question of suicide was for the jury.<sup>1</sup>

<sup>1</sup> *Burnham vs. Interstate Casualty Co. of New York*, 75 N. W., 445, 1898.

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